



# technology review

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## AUGUSTUS LOWELL

By the death of Mr. Augustus Lowell the Institute of Technology has lost a warm friend, a wise counsellor, and a constant and liberal benefactor.

He came of an old and well-known Massachusetts family, some of whose representatives, in their successive generations during the last hundred and twenty years, have done eminent public service to the State and the country ; while others have been foremost among the men to whose courage, foresight, industry, and skill we owe the origin and prosperity of the manufacturing enterprises of Massachusetts.

The Rev. John Lowell, for forty-one years the honored and trusted minister of the third parish in Newbury, was the father of the first Judge John Lowell, one of the three judges appointed by the Continental Congress for the trial of appeals from the Courts of Admiralty, who was afterward commissioned by Washington as judge of the United States District Court of Massachusetts, and promoted by John Adams to be chief justice for this circuit of the short-lived United States Circuit Court, which was abolished by Jefferson's first Congress the year after its creation by the Federalists. Judge Lowell will, perhaps, be longest remembered as the person who secured the in-

sertion in the Constitution of Massachusetts of the declaration, "All men are born free and equal," which was afterwards judicially decided to have abolished slavery in this State. Judge Lowell's oldest son, John Lowell, was a brilliant lawyer, a leading spirit among the Federalists, and the oracle of that party in Massachusetts. His only son, John Amory Lowell, was the father of Augustus Lowell, who was born in Boston on the 15th of January, 1830. His mother was a daughter of the Hon. Samuel Putnam, for nearly thirty years a judge of the Supreme Judicial Court of Massachusetts.

Augustus Lowell was fitted for college at the Boston Latin School. He was a manly, frank, honest, high-spirited boy, a person of influence with his classmates, and possessing the confidence and good will of his teachers. He entered Harvard at the age of sixteen, and was graduated in 1850. After leaving college, he travelled in Europe with his father and family for about a year. Returning in 1851, he went into the counting-room of Bullard & Lee, a firm composed of the late William Bullard and Colonel Henry Lee, who were at that time leading merchants in the East India trade. He remained two years with them, and then went to Lowell to study manufacturing. He was subsequently for a time with the firm of James M. Beebe, Morgan & Co., where his business education was completed.

He then formed a partnership with Mr. Franklin H. Story, and had a counting-room on Central Wharf. They were engaged in the East India business, and continued in that until the crisis of 1857 put an end for the time being to the Calcutta trade here, and to many of the traders, though it is believed that by his India business Mr. Lowell rather made than lost money.

Judge Lowell's second son, Francis Cabot Lowell, was in early life a merchant; but when the British orders in council made a British protection necessary to secure vessels from capture on the high seas, and Napoleon's decrees directed the confiscation of any vessel and its cargo provided with such a protection, foreign commerce for the Americans became so hazardous as to be practically impossible, and Mr. Francis Lowell conceived the idea that, as we were much nearer the cotton fields of the South, we ought to be able to manufacture cotton goods for ourselves instead of importing them from England. The first experiment in this direction was made at Waltham; and, as its success justified engaging in the business on a larger scale, Mr. Lowell and his associates started new mills at the falls of the Merrimac, and called the settlement Lowell.

John Amory Lowell was early interested with his uncle in his manufacturing business, was one of the founders of Lowell, and at a later date of the city of Lawrence. The financial crisis of 1857 affected very severely the cotton mills in Massachusetts, and Mr. Lowell found his property for the moment seriously impaired. Augustus, who had just retired from the East India business, took a desk in his father's office, that he might assist him in the management of his affairs; and in this office he remained until his father's death.

He had married in 1854 the younger daughter of the Hon. Abbott Lawrence; and in 1864 he went abroad on account of her illness, and remained away a couple of years.

In 1875 he became treasurer of the Boott Cotton Mills at Lowell, which had been built by his father; and he held this position for eleven years. He was also for a few months in 1877 the treasurer of the Merrimac Manufacturing Company, but was never afterwards the active manager

of any business. He was, however, connected as president or director with a large number of business corporations; was for years one of the governing body of the Provident Institution for Savings, and from 1898 its president; was a director of the Massachusetts Hospital Life Insurance Company; for twenty years was president of the Boston Gas Light Company, and connected with many other manufacturing and business corporations, in the management of which he took great interest and was often an important factor. He was a member of the Colonial Society of Massachusetts, of the Massachusetts Historical Society, of the American Association for the Advancement of Science, and vice-president of the American Academy of Arts and Sciences. He never held but one public position: he was one of the Boston School Committee in the years 1857-58. He did, however, in two capacities, a great work for the public benefit. Upon the death of his father in 1881 he became the trustee of the Lowell Institute. The objects of this trust are, perhaps, too well known to need any enumeration here; but a brief statement of them may not be altogether amiss.

John Lowell, Jr., a cousin and brother-in-law of Mr. Augustus Lowell's father, created by his will a trust, the income of which was to be devoted to the maintenance and support of public lectures to be delivered in Boston, upon philosophy, natural history, the arts and sciences, and such other subjects as the trustee for the time being should think expedient. Mr. John Amory Lowell, Augustus Lowell's father, was the trustee named in the will, which contained a provision that each trustee should appoint his own successor. The trust became operative in 1839; and for more than sixty years the citizens of Boston have had in each winter, under the wise benevolence of its founder, and the

careful and judicious management of the successive trustees, the opportunity of hearing lectures from the best men in the various departments of philosophy, history, literature, and art, as well as the last word in scientific discovery from the leaders in their respective branches of study and investigation. It was to the munificence of its founder and the wisdom of its first trustee that we owed in 1846 the visit of Louis Agassiz, then the foremost naturalist of the day, who came here to lecture at the Lowell Institute, and, remaining here as a Harvard professor, inspired an enthusiasm for scientific investigation and study, which, beginning in his own department, spread into every other, and to which we owe the Agassiz Museum at Cambridge, a monument to his memory and to the scientific research and munificent liberality of his family.

To discharge thoroughly the duties of trustee of the Lowell Institute, in addition to those connected with the management of the property which constitutes its fund, requires, in making a wise selection of the subjects to be treated of, much thought, a sound judgment, attention to the wants and desires of the public who are to be instructed and a knowledge of the persons most competent to lecture upon these subjects.

Succeeding to this trust upon the death of his father in 1881, Mr. Augustus Lowell gave himself conscientiously, carefully, and intelligently to the duties thus imposed on him. He had never received any special scientific education or training; yet by his reading and study he made himself sufficiently familiar with scientific subjects to be able to judge of the merits of the lectures on these subjects, while he also kept himself so far in touch with the leading men and discoveries in science as to select wisely both the lecturers and the subjects which would be of most interest

and advantage to the public, and was so constant an attendant upon these lectures that he could judge of their value and fitness for a popular audience, and observe as each course progressed the favor with which it was received by the public, as indicated by the increasing or diminishing numbers of the audience.

Besides the popular lectures, admission to which is to be had by ticket, the founder of the Lowell Institute provided by his will for others "more abstruse, erudite, and particular"; and under this clause lectures have been given for many years to advanced students under the direction of the Institute of Technology, as well as to the school-teachers of Boston, under the supervision of the Society of Natural History, and more recently to workingmen under the auspices of the Wells Memorial Workingmen's Institute; while the Lowell School of Industrial Design in connection with the Institute of Technology has been maintained from this fund for nearly thirty years.

In founding the Lowell Institute, John Lowell, Jr., builded better than he knew. He provided for the people of Boston opportunities of gratuitous instruction, improvement, and enjoyment far beyond anything that he in his lifetime could by possibility have anticipated. The importance and influence of the Lowell lectures has steadily increased, their scope has been constantly enlarged, and the public interest in them has continually grown. No record, however, of all that in sixty years the noble gift of John Lowell, Jr., has accomplished would be complete if it failed to recognize how much is due to the skilful business management of the successive trustees, father and son, and to the fidelity and devotion with which they have endeavored to carry out the purposes of the generous giver in the spirit which inspired him. A casual observer, seeing only

what appears on the surface, would have but little idea of the amount of time and thought the proper management of this trust requires ; but a few years ago a work was published giving a history of the Lowell Institute, from which one can judge how important and engrossing are the duties of the trustee. These duties Mr. Augustus Lowell discharged with a fidelity and ability which cannot be overestimated, and the service which he in this way rendered to the public is one which should not be forgotten.

In the Massachusetts Institute of Technology, Mr. Lowell from his connection with various manufacturing enterprises naturally took a great interest. His father had seen at the outset that this school was to some extent in the line of the purposes which John Lowell, Jr., had in view in founding the Lowell Institute ; and he had therefore made use of it as a medium for carrying out these purposes. Mr. Augustus Lowell was elected a member of the Corporation of the Institute in 1873, when the financial depression of that period, which was aggravated in Boston by the great fire of the previous year, was beginning to be severely felt. This condition of things and the ill-health and resignation of its president and founder, Professor Rogers, had a great effect upon the Institute, then barely twelve years old, and for some four or five years it seemed very doubtful whether it would survive, or succumb from lack of the funds necessary for its support ; but with the reviving prosperity of the country the numbers of its students again increased and its fortunes steadily improved.

Mr. Rogers had seen during this period of depression that the Corporation of the Institute as then organized was an unwieldy body, unfitted to secure an efficient administration, and in October, 1875, had suggested that it might



perhaps now be wise "to try to select a small but efficient Executive Committee who should have the time and ability to give a real supervision and to aid the president." Nothing came of this at the time, however, nor until after Mr. Rogers's death, when in April, 1883, Mr. Augustus Lowell moved for the appointment of a committee to consider and report upon this subject. A committee was appointed; and a month later they made a report proposing a scheme of organization which was then adopted, and which has worked entirely satisfactorily ever since. Under this scheme there are chosen five members of the Corporation, who with the president and treasurer constitute the Executive Committee, and are charged with the immediate management of the affairs of the Institute, much as the directors of a business corporation. Each of these members is elected for five years, and the matter is so arranged that one member goes out each year. Mr. Lowell was chosen a member of this committee when it was first organized. A year later he was appointed on the Committee on Nominations, and held both these positions until his death.

Some idea of the fidelity with which he discharged his duties on these committees and the interest which he took in them may be had from the fact that the records show that out of 277 meetings of the Executive Committee from 1883 to 1900 he was present at 247.

The work of this committee covers almost every subject connected with the Institute of Technology. It includes the arrangement of the different courses of instruction, the introduction of new courses, the appointment of instructors, the management of the property, and the providing of ways and means to meet the expenses of the Institute. For many of the years while Mr. Lowell was on the Executive Committee this last matter was a source of con-



stant anxiety and difficulty ; and much time and thought were given to the discussion and determination of what could be done, what must be abandoned or modified, what further economies could be initiated, and how the slender resources of the Institute could be best used to tide it over the financial difficulties which weighed upon it so heavily. To the consideration of all these questions Mr. Lowell gave the best that was in him ; and the Institute had the advantage of his business skill and experience, of his financial caution, of his zealous interest and his broad views as to the aims and objects of the Institute, and his fixed purpose that these should be ultimately carried out, but that their success should not be hazarded by too much haste or by incurring expenses and embarking on undertakings which the resources of the Corporation did not fairly warrant.

As time went on, the Institute of Technology became one of the principal interests of Mr. Lowell's life. It not only occupied his thoughts when he was able to attend to his duties, but it also served to distract his mind when he was ill and suffering. On its twenty-fifth anniversary he delivered a commemorative address, in which he gave an account of the history and development of the school, of its methods of instruction and their adaptation to the changes and developments in practical science.

After a severe illness in the summer of 1899, from which he never fully recovered, Mr. Lowell tendered his resignation as a member of the Corporation ; and the appreciation which the other members had of the value and importance of his services, and of the great loss which the Institute would sustain by his resignation, is shown by the fact that a letter was sent him, signed by all the members of the Corporation, in which they say : —

In reviewing the years since you first became one of the Trustees of the Institute in October, 1873, and comparing its condition and prospects at that time with its position and outlook to-day, the members of the Corporation feel that they cannot overrate the value of your services in its behalf. Your knowledge of what the Institute has already accomplished is so complete, your vision of still higher accomplishment by it so clear, your judgment in shaping its policies so sound, and your zeal in promoting their execution so generous and disinterested, that to be deprived of them would be to the Institute a most serious misfortune.

It is therefore the earnest wish of the Corporation that you would assent to their taking no further action at present upon your letter, in the hope that in the near future your health will be so restored that the Executive Committee may continue to have the benefit of your counsels as one of its members, even though you should not be able at all times to attend its meetings.

Mr. Lowell was much moved by this letter and the strong feeling which it showed; and, though in poor health, he assented to the request, and continued to serve on the Corporation and Executive Committee, attending the very last meeting of the Corporation on the first day of June, three weeks before his death.

As trustee of the Lowell Lecture Fund, he had the opportunity of so employing its funds in carrying out the purposes of its founder as to assist the Institute of Technology and its professors; and, in doing this, he followed in the footsteps of his father, who had from the beginning made use of the Institute as a medium for carrying out the purposes of Mr. John Lowell, Jr., in his bequest. Augustus Lowell was also, in his own person, a generous benefactor to the Institute of Technology, his gifts to it, including the bequest contained in his will, amounting to \$120,000.

Mr. Lowell was a man of great business sagacity, prudence, and foresight. His business knowledge and experience were extensive, his judgments well considered, and for

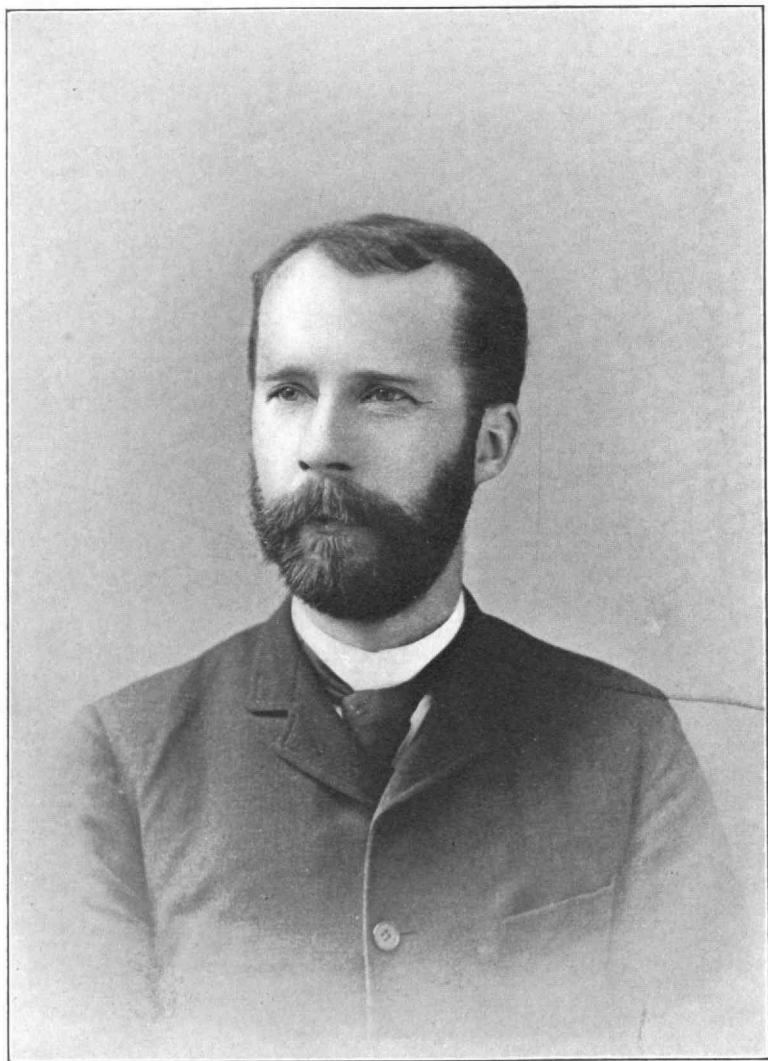
the most part sound. If he sometimes seemed to reach his conclusions quickly, it was not because he arrived at them hastily or by any snap judgment, but rather because the matters and contingencies on which he was called to act had previously occurred to him as possibilities, been carefully and deliberately considered beforehand and his conclusions substantially reached. He was tenacious of his opinions, able and earnest in advocating or defending them, sometimes perhaps insisting on them too strenuously, and not always sufficiently considerate of those who differed from him, or conciliatory in his manner toward them; but, if he were voted down, though he were not convinced, he at once accepted the result. He had a very high sense of business honor and propriety; and, if he thought that something ought to be done, he never hesitated to do it because it was disagreeable or seemed to be harsh, however painful and unpleasant it was to him personally to undertake it.

He was one of those men whom time ripens and mellows. He was from his boyhood a person of strong feelings and affectionate nature. He never forgot a friend, and the intimates of his childhood were the friends of his latter days. He had by inheritance a strong love of horticulture, and found one of his great pleasures in his garden and greenhouse; and it is curious to note that this love for flowers was a distinctly hereditary taste. His great-grandfather, Judge Lowell, was president of the Massachusetts Agricultural Society, and contributed to the establishment of the Botanic Garden of Cambridge. His grandfather, the distinguished Federalist, retired from the bar quite early in life, and was much absorbed in his garden and flowers. His father had the same tastes and interests, and was an enthusiastic botanist. After his return from Europe, Mr.

Lowell moved to Brookline, where he lived for many years, both summer and winter, and which was always his home. Here he died on the twenty-second day of June, 1900. His wife had died some years previously.

He left five children,—three daughters and two sons, both of whom are members of the Corporation of the Institute, and one, his successor as trustee of the Lowell Lecture Fund, has taken his father's place on its executive committee.

THORNTON K. LOTHROP.



SILAS WHITCOMB HOLMAN.

## SILAS WHITCOMB HOLMAN

CLASS OF '76, M. I. T.

*(Died April 1, 1900)*

Silas Holman was one of the noblest men that I have known. He had a keen intellect; a strength of purpose that triumphed over the limitations of his frail body; a heroic, steadfast, and cheerful spirit, undaunted and unim-bittered by keenest misfortune; a kindly, gentle nature; and a pure heart. He spent the twenty best years of his life in earnest service as instructor and professor in the Massachusetts Institute of Technology, working earnestly to inculcate high ideals, enjoying to a remarkable degree the respect and affection of his students and of all his associates. Such as he had, and all that he had, he gave; and those who knew him well will not hesitate to name him among the remarkable benefactors of our Alma Mater.

### PERSONAL RELATIONS

He was born in the pleasant country town of Harvard, Massachusetts, January 20, 1856. His father was Silas Whitcomb Holman, of Harvard, a descendant of the Whitcomb and Eveleth families of Bolton and Stowe, who were among the earliest settlers of these old Massachusetts towns, one of his ancestors on the Eveleth side having been the earliest settled minister in Stowe. His mother was Anna Elizabeth Homer, of Boston, a descendant of the Homer and Davis families of that city. Silas was their only child. His father died a few weeks previous to his birth, and dur-

ing his infancy his mother took him with her to Cambridge to live. Left thus alone, the welfare of her only son became her main thought. The son responded faithfully. The mother was a woman of charming character, and from her influence and from this mutual devotion came much of his gentleness.

Here in Cambridge he lived and passed his boyhood, attending the public schools, the excellence of which has always been noteworthy; and in June, 1872, he had completed three years of the four years' course of the Cambridge High School. He then determined to enter the Institute of Technology, and gave the long summer vacation to studious preparation and entered the regular course of the Institute in October, 1872, thus becoming a member of the class of 1876. With the beginning of the school year in 1873 certain new regular courses of study were established, one of these being the course in physics; and for this our friend promptly enrolled himself.

My recollections of him at about this time are of a young man of slender figure, but tall, of ordinary muscular strength, full of life, enjoying fun, and awake to all that might properly interest a student. Classes at the Institute were in those days small in comparison with present classes, but '76 with its 127 students was by far the largest class that had entered up to that time. Crowded accommodations caused a very thorough weeding out and the financial panic of '73 forced some good men to withdraw, so that only 42 of its members continued through the four years as regulars and received their degrees; but this was still a large class for those days, and, indeed, not until ten years more had passed did a class of equal numbers enter or graduate. We believe this large class had its fair proportion of bright young men, and among them Holman was



easily the leader in the class-room. His high standing and popularity led to his being made a commissioned officer in the Institute Battalion at the beginning of our second year,—military drill in those days was continued through two years of the course,—and by the time class organization came “the office sought the man,” and his quiet popularity compelled his service as president of the Class Association. He continued president of our Class Association, and foremost in all movements for kindling and continuing a strong fraternal spirit among its members, for eight years, until relieved in 1883 at his own very urgent request. Throughout our student days his high standards of thought and his hard common sense, voiced with rare tact, were potent forces that aided in establishing public opinion among the class on a rational and wholesome basis.

So soon as the course of instruction in laboratory work permitted the subject of his investigations to follow his natural choice, he developed a special interest in the phenomena of heat; and to the last this field of research was most attractive to him, and in it he did original work of a very high order of merit. His graduating thesis was on “The Atomic Theory as applied to Gases,” and reported a study of the effect of temperature upon viscosity. This was a very noteworthy piece of scientific work, particularly so for an undergraduate, and was published, with abridgment of some parts and extension of others, in the Proceedings of the American Academy of Arts and Sciences in 1876, and attracted the favorable notice of physicists abroad.

In the vacation at the end of the third year he joined with his classmates Henck and the lamented Hollingsworth for a tramp in the White Mountains. Struck by the crudeness and the inaccuracy of the best maps of this region



then obtainable, Mr. Henck extemporized a rude plane-table, and set to work at each summit visited to lay down the azimuth of all mountains and noteworthy topographical features visible therefrom. Holman seconded Henck's efforts ably in this work; while Henck became more and more interested in the matter, gave the remainder of his vacation to prosecuting the work, soon interesting Professor E. C. Pickering and others in a way that subsequently led directly to the formation of the Appalachian Mountain Club, in which Holman took an active interest, although prevented by his lameness from joining many of the excursions. Among his published contributions to the work of the club, we find in the first volume of *Appalachia*, in 1876, "Notes on Two New Forms of Mountain Barometer," and in its third volume, in 1882, "Notes of Hypsometric Measurements of Some Points about Williamstown."

I have always understood that the lameness from which our friend suffered so severely for years first developed as the result of an overstraining of muscles while tramping and mountain climbing on this trip; but Henck holds that the first serious trouble began with an over-exertion in seeing the Centennial Exhibition in Philadelphia in the following year, when Holman was an enthusiastic member of our Technology Encampment on the Campus of the University of Pennsylvania. Holman himself seldom or never said anything about the cause or the extent of his lameness, but for nearly twenty-five years manfully struggled to keep it in the background.

In the autumn of 1876, with the opening of the term following his graduation, he received the appointment of Assistant in Physics in the laboratories of the Institute; but his lameness, although still mainly confined to one knee, had greatly increased, and prevented him from entering

upon the duties of the position. In January, 1877, he wrote me regretfully of this delay, and stated that it had then held him back six months from work which he longed to undertake. In February, 1877, still on crutches, he sailed for the Azore Islands, in the hope that the sea voyage and the change would bring up his general health, and so conquer his infirmity. After an absence of six months he returned much improved, although not entirely recovered, but by December, 1877, was able to take his place in the Physical Laboratory.

He continued giving instruction under the title of Assistant for four years, and then received appointment as Instructor, at the beginning of the term 1880-81. In the fall of 1881, which is a noteworthy date as marking the beginning of General Walker's administration as President, Mr. Holman was elected secretary of the Society of Arts, an office requiring a good deal of attention in securing proper subjects for presentation, and calling for considerable work in the preparation of its reports and proceedings for publication. He continued in this position for two years, resigning only in order to obtain time for the preparation of a course of Lowell Institute Lectures on Heat, given in connection with Professor Nichols.

He was earnest in the work of promoting a wider spirit of fraternity through the Alumni Association, was a member of its Executive Committee from 1878 to 1882, and its vice-president in 1882 and 1883. The foundation of the alumni fund was directly due to his initiative, and he was foremost in many good efforts for the success of the Association in its early days.

In the years 1880 to 1883 it was frequently my good fortune to visit Holman and his mother at their home, where it was always a pleasure to note the relations existing

between them. Deprived as he was of his father's companionship and counsel, his mother, a woman of remarkable force of character and charm of manner, came to be his associate in study and work to an unusual degree; and I have never seen a companionship between mother and son that approached the ideal so closely. While he was secretary of the Society of Arts, his mother attended its meetings and prepared many of the abstracts of its papers for publication, proud to share in her son's work and glad to save his strength. Her sudden death in December, 1883, came to him with a shock and a sadness all the deeper because of this uncommon devotion and unity of life.

On July 1, 1884, he married Miss Marie O. Glover, of Brooklyn, N. Y., a graduate of Vassar College and a graduate of the Institute class of 1881. Miss Glover had shown rare quality as a student and excellent skill in research, as certain of her essays published later bear witness. With her intellectual vigor there was no abatement of the sweet spirit of womanliness and domesticity, and this union appeared ideal. For a few brief months the merited happiness appeared to have settled over all his affairs; but this was cruelly broken on May 5, 1885, by her death after a very brief illness. How powerful and sacred the influence and inspiration of her singularly strong and gentle character continued with him to the end is known only to his most intimate friends. He has left a touching record of it in almost the latest words that his failing strength could pen.

Professor Holman's own personality was of the rarest, most inspiring character that I have known; and I have not the skill in words to portray it, or make its peculiar quality plain to one who has not known him personally long and well. Alertness with patience, gentleness with

courage, intellect with warm sympathy, hearty merriment with the keen conscience of a Puritan, skill and ingenuity in mathematics no less than in mechanics, and withal delightfully human,—it is by this personality that his friends will always recall him rather than by his writings or his researches.

#### WORK AS A TEACHER

As already stated, Professor Holman's work as a teacher at the Institute began in December, 1877, under the title of "Assistant in the Physical Laboratory." He continued in active work in the laboratory until December, 1895, by which time the lameness, from which he had suffered severely much of the time for nearly twenty years, had so progressed that he could no longer even be carried to his desk, as had been the practice for some time before he gave up attendance in the class-room. He was first listed as Assistant Professor in the Catalogue of 1882-83, Associate Professor in 1885, Professor of Physics in 1893, and in 1897 Professor Emeritus. Meanwhile, for five winters or more, he also gave various "Lowell Courses" to evening classes of teachers and others.

During all these years of his teaching I saw and heard much of Professor Holman and of his work from two quite different points of view,—from my own visits to him in his home and in his laboratory, and from the reports that came to me from many of his students, several of whom became employed upon the works with which I was connected, and with whom "how things were going at the Institute" was always an interesting topic. The uniformly earnest terms of admiration and affection with which all who had come under Professor Holman's teaching spoke of his approachableness, his patience, his encouragement toward thorough work and honest interpretation, and his

general helpfulness, were very remarkable. An illustration of the habit which contributed to his success is found in the testimony of a student who had been called before him on some matter of discipline, and who records the impression made upon him by the fact that Professor Holman treated him as a gentleman of whom he had a request to make, not as an offender.

From many conversations with him I know how near and dear to him was the work of his class-rooms, how earnest he was that the scientific method and laboratory study should result in something more than the training of the eye and hand, that it should deepen and broaden the foundations of character; how earnest that the Institute should send forth, not merely facile workers, but men of uncompromising integrity; that the student should be trained to the habit of thought of the judge, and should scorn the one-sided view of the mere advocate; how earnest that, as an example for the good of others, the utmost penalty should swiftly be visited on a student who should be guilty of dishonest work; that the student should form the habit of setting traps to catch his own unconscious errors of observation; should form the habit of keeping in view during every computation the limit of precision that the data gave and the purpose required; and that the habit should be formed, in carrying on every piece of research work, of first seeking the line of least resistance, and always practising true economy of effort.

It has never been my good fortune to know one who appreciated with keener conscience the high office of teacher.

After increasing lameness had made him a prisoner in his home, he continued for some months to review the notes of work done in the laboratory over which he had so

long presided, and to consult regularly with his associate teachers, and thus to shape and in a measure direct the work. And after muscles had wasted so that he could no longer stand or sit upright and joints had stiffened and fingers could no longer hold the pen, and, most cruel of all, eyesight had failed, with supreme strength of purpose, and even with profounder intellectual effort, he threw his remaining strength into a remarkable series of scientific essays, and into two books with which he sought to round out and finish his work as a teacher.

As his classmate Greeley said in announcing his death to the members of the Chicago Alumni Association, "Holman in his last years of suffering and blindness was even a greater teacher than in the fulness of his strength, for he taught how an indomitable soul can conquer the limitations of a poor, weak body."

#### WORK AS AN INVESTIGATOR

Professor Holman's success as a teacher in the laboratory was no less marked than his success as an original investigator. His love and enthusiasm for scientific research were reflected in his teaching, and were the cause of the enthusiasm with which he inspired his students for scientific work.

His unusual ability as an investigator manifested itself while he was still a student; and his first contribution to science, "On the Effect of Temperature on the Viscosity of Air," published in 1876, the year of his graduation, together with a number of other papers on the same subject published between the years 1876-1886, established for him an international reputation. His work on the "Viscosity of Gases" remains to-day unsurpassed for its accuracy and elegance. Unfortunately, the demand made on his time by the

development of the Physical Laboratory, particularly that of Electrical Measurements, and later that of Heat Measurements, prevented his devoting but little of his own time to research during the last ten years. He continued, however, to direct with marked success many of the theses of students in physics and electrical engineering, as a number of published papers testify. Two of these in particular should be mentioned: the first a valuable contribution to high temperature thermometry on the "Boiling Points of Naphthalene, Benzophenone, and Benzol under Controlled Pressures with Special Reference to Thermometers," published with W. H. Gleason in 1888; and the second on "The Melting Points of Aluminium, Silver, Gold, Copper, and Platinum," published with R. R. Lawrence and L. Barr in 1895. The latter investigation was the last which Professor Holman was able to direct at the Institute. In the year 1895 he also presented to the American Academy a group of valuable papers on Calorimetry and Pyrometry, subjects in which he was then particularly interested, in connection with the work of the Heat Laboratory.

His interest in scientific work never once flagged even after he was compelled to relinquish active work at the Institute; and through the devotion of Mrs. Holman and his friends he continued to keep in touch with much of the current periodical literature of his beloved science up to the very close of his life.

His advice was always eagerly sought and much appreciated by his colleagues, especially on all matters connected with investigations going on in the laboratories; for seldom was a difficulty presented to him for which he could not offer some valuable suggestion.



AS AN AUTHOR

Although Professor Holman prepared several very valuable text-books and his name for research is well known among scientific men, his memory and influence will live chiefly in the hearts of his pupils and of his intimate personal friends and in their work. The desire to be of service to his pupils, to his associates, and to his Alma Mater, lay nearer to Holman's heart than love of fame or gain; and so his publications, many of which are of profound scientific merit, were nearly all of them but incidents in his work as a teacher. While there comes to the author of important researches and lucid text-books a broader fame than to him who teaches by personal intercourse, the mere author awakens to a far less extent those higher and deeper forces which control the course of life.

On page 68 of the Register of Publications published by the Alumni Association in 1893 are given the titles of twenty-two scientific papers by Professor Holman, and since that time six more noteworthy contributions are to be added. Almost without exception these relate to his work in the Physical Laboratory, and nearly all of the twenty-eight publications are comprised under the two general topics: first, text-books intended for use with his students; and, second, records of studies in precise thermometry and records of original researches into the effect of temperature upon the viscosity of various gases.

To the first number of the TECHNOLOGY REVIEW in January, 1899, he contributed a remarkable article upon "The Function of the Laboratory," full of thought and discrimination, showing the broader opportunities in certain directions and warning against the dangers of certain popular tendencies. To the *Technology Quarterly* he made



frequent valuable contributions during these later years, also to the Proceedings of the American Academy of Arts and Sciences, all of them papers marked by profound technical knowledge and great skill in mathematical analysis. He had in contemplation a text-book for teachers of physics in the preparatory schools, addressed to teachers rather than pupils, which was born of his experience with the inadequate preparation of students entering his classes, but which he did not finish. He left also several unpublished manuscripts that were prepared and recorded by dictation in those days of pain and suffering in 1898 and 1899 in which a less heroic man would not have attempted work. One of these papers, which he modestly withheld, perhaps because not yet finished to his satisfaction, is entitled "Does the Engineering Profession underrate its Value as a Factor for Good Government?" and is so full of suggestive thought that I hope it may find a place in the future pages of the REVIEW.

The text-books from his pen are not ostentatious. The first was entitled "Physical Laboratory Notes,"—two small volumes, each of about a hundred pages, closely printed in small type, filled with notes for the student to use in studying the methods of the various physical measurements in the fields of heat, light, and electricity. These books are full of valuable suggestions upon the best methods of manipulation; upon the sources of error to be guarded against; upon devices for measuring the limit of uncertainty; and suggestions of methods for determining the mathematical expression of the law of variation, from the values observed in experiment. These "Notes" are remarkable for range of subjects and for clearness with brevity; yet they are books of no literary pretension, having been intended merely for use of the author and his assistants as memo-

randa for supplementing their oral instruction in the Physical Laboratories of the Massachusetts Institute of Technology, and were as yet incomplete along many lines of research work followed in these laboratories. His industry in the development of the laboratories may be inferred from the fact that these "Notes" passed through seven editions between 1885 and 1895. As often stated by Holman, "These notes were printed, but were not published." Had his life and strength been spared, a monumental treatise along this line might have been hoped for from his pen. He also prepared a set of Lecture Notes on Heat in 1886.

His third book was a volume of 176 pages, entitled "Discussion of the Precision of Measurements," published by Wiley in 1892. This book was the outcome of several years of teaching those lessons which it has always appeared to me were Holman's special mission, and it covered a field in which his good influence was felt with peculiar force in the after-work of all his students. The lesson of this book was to distinguish between precision and accuracy, to keep the margin of possible error in measurement always clearly in view, to set traps to discover the margin of error, and to avoid useless places of decimals and non-significant figures, and to save the waste of effort which comes from straining under the load of more figures than the data warrant or the ultimate result requires. This book reflects on every page the appreciation which the author had of investigating the instrumental and experimental errors involved in an investigation before commencing the research itself; and the importance which he attached to discussions of this kind did much toward raising the standard of the laboratory as an educational force to where it is to-day.

His fourth book further exemplified the lessons that

I have described above. It was entitled "Computation Rules and Logarithms," a book of about 120 pages, published by Macmillan in 1896. Its keynote may be stated in the first four lines of his preface, namely:—

It would probably be within safe limits to assert that one-half of the time spent in computations is wasted through the use of an excessive number of places of figures and through failure to employ logarithms.

To about forty pages, forming what, so far as I have seen, is the best brief treatise that exists on methods of computation, is added, in about seventy-five pages, a set of mathematical tables arranged and selected with a view to quickness of use and to the degree of precision required in ordinary engineering computations, consisting of powers, roots, reciprocals, logs, anti-logs, and trigonometric functions carried to only four or five places of decimals, but sufficient to admit in general no computation error greater than one-twentieth of one per cent.

His fifth and last book, entitled "Matter, Energy, Force, and Work," a profound yet wonderfully lucid treatise on the fundamental physical concepts, published in 1898 by Macmillan, was prepared while the author was wasted by keen physical suffering and in blindness; but no shadow from all this trouble can be seen on his work. As I turn its pages and enjoy the beauty of its clear-cut statements and its broad, firm grasp of some of the deepest problems of philosophy, I marvel more and more at the keenness of intellectual vision and the strength of will and purpose that under such limitations and discouragements produced such a work. He wrote the book to continue the teaching that he could no longer give in person, because his heart was in the work, and from his earnest conviction that clear fundamental conceptions of the physical forces

were essential to the engineer or chemist who would understand the science of his profession and would gain that sharpness of intellectual vision that may clear the way to further progress.

In September, 1886, when health had in a great measure returned and the future again looked bright, he married Miss Lydia M. Newman of Falmouth, Maine, of "Mayflower" ancestry and kinswoman of many who have led the intellectual life. One child, Anna, was born to them on July 11, 1892, who has been the veritable sunbeam of the household through the recent weary years. Their home was first at Auburndale, adjoining the home of his classmate, Professor Lewis M. Norton; but later, as lameness returned, they made their home in pleasant Back Bay apartments, in order that he might be near the Institute and accessible to the calls of his friends. The memories of many cheerful yesterdays crowd around the picture of that home. Their summer home was a simple artistic cottage that he had built in the woods and under the pines on Bear Island, Lake Winnipiseogee. He had chosen its location for its quiet, secluded beauty, after much cruising about the lake, and found the summers in it always restful and refreshing. In a way it came to be his real home more than the city domicile, and there was much in it and about it that was characteristic of the man.

When physical helplessness came to Professor Holman, in the last four or five years of his life, a wealth of unselfish devotion was given by his noble wife; and to her little less than to him are we of the Institute indebted for the profound scientific works that he put forth in these later years. Her modesty has sought to hide the earnestness and extent

of her work ; but it could not but be noted, and with deep admiration, by the intimate friends. She was at once the devoted nurse, the guardian of his strength, his intellectual companion, his amanuensis, and his searcher for references and authorities in English, French, and German scientific literature.

In the later years they made their home in Brookline, in a location chosen largely for quiet and for accessibility to friends. I shall always treasure the memory of an evening spent at this home two years ago, at about the time his last book was published. Professor Hale, Professor Goodwin, and I were calling. Professor Holman, sadly crippled and wasted from rheumatic arthritis, sitting in blindness, bolstered up in his reclining chair, with cheerful voice, quick question, and clear replies, discussed with Professor Hale his researches in astral physics, and with Professor Goodwin the work in the Technology Laboratory and recent researches on incandescence. By sheer force of cheerfulness he made his visitors forget his own sad plight. Good-fellowship and soon even merriment prevailed at times. Throughout the evening so skilfully did Holman lead and direct the conversation that not a word of commiseration for himself was permitted to enter.

I venture to quote from a recent letter of one of Professor Holman's distinguished pupils, Professor George E. Hale, director of the Yerkes Observatory of the University of Chicago. A hundred others would echo the words of his first paragraph.

One of the highest privileges I enjoyed at the Institute was my association with Professor Holman in the Physical Laboratory. His contagious love for scientific research, his clearness of view and of expression, and his sympathetic interest in the work of his pupils were dominant qualities which made him an ideal teacher and a never-failing source of inspiration.

His most important contribution to the Department of Physics is undoubtedly his course on the precision of measurements, the influence of which is certain to be felt in every progressive physical laboratory.

I shall never forget our last conversation. The wise decision which resulted in the election of Dr. Pritchett to the Presidency had not yet been made, and his mind was filled with concern for the Institute's future. He felt the need of a strong leader to head the advance, but, assuming that such a leader could be found, the years to come seemed bright with promise. The fullest success, he believed, will be attained only when great prominence is given to advanced work, and particularly to original research on the part of both faculty and students. In spite of his infirmity, the old fire was in his voice as he gave expression to the hopes he had so long been cherishing. His death soon followed; but I have often rejoiced that his influence, always powerful for good, did not cease with his retirement from the Institute, and still remains as a strong incentive to further progress.

In Holman's brief letter to the North-western Alumni Association at their annual dinner held in Chicago but a few months before his death, he voiced a sentiment on which he had long pondered, and which I feel may well be taken as his last words to his brother Alumni. I therefore give this letter almost entire: —

*To the Members of the North-western Alumni Association:*

In response to your kind invitation, I gladly send a few words of greeting.

If it were possible for me to be with you to-night, I know that I should find myself among warm-hearted and loyal friends, among friends whose fellowship is a privilege; men with red blood in their veins; men in full swirl of active life, in touch with events, and able to discern their trend. To you, as friends and as men who can weigh possibilities, I offer with enthusiasm a thoughtful toast: —

**The Institute: Grandly conceived, nobly developed, foremost in technological education,  
— shall it not also be foremost in science?**

True technology is science scientifically applied. Science and the product of scientific investigation are the bone and sinew of technology. The scientific method is the brain of the industrial arts, as artisan skill is the brawn.

Should not science, then, work side by side with technology? Are they not two lusty sons of the same fostering mother? and should they not,—nay, must they not,—for the best development of both, grow up together?

To turn from figures of speech, is or is not the leading technological college of the next quarter-century to be that one which is, at the same time, a leading scientific centre? Is or is not the time ripening when the community, wisely appealed to, will generously support pure science and research as well as technological investigation in that institution which will undertake it? Shall the Massachusetts Institute of Technology be that Institution?

SILAS W. HOLMAN.

I can close this brief and imperfect sketch of our good friend no better than by repeating his own words of a few short months ago with which he began his delightful memoir of a classmate:—

“Of the threescore years and ten of man’s allotted term of life the first score brings maturity of the body, the second that of mind, and from the years that follow should rise the noblest product of the life. For him these later years were not to be; and sorrow at the loss of a true friend is deepened by our keen perception of their promise, by the high character and large achievement of so short a life.”

JOHN R. FREEMAN, '76.

## INAUGURATION

OF HENRY SMITH PRITCHETT AS PRESIDENT OF THE  
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

OCTOBER 24, 1900

In accordance with the announcements in previous numbers of the REVIEW, inauguration exercises were held at Symphony Hall on the afternoon of October 24. At a meeting of the General Committee early in the fall, Dr. Williams was appointed chief marshal; and assignments were made for the separable duties of preparing the programme and arranging for music, ushers, guests, etc. It is needless to say that the aggregate amount of work involved was in the end enormous, but that unlimited co-operation was at the services of the committee, and that every co-operator felt fully repaid by the intrinsic success of the exercises and by the value to the Institute of the admirable effect of the whole upon the larger public, as well as upon the officers and students of the school. A partial list of guests assigned places on the platform is as follows:—

Representatives of other colleges: Amherst College, Professors Todd and Grosvenor; Brown University, Professors Barus and Burnham (M. I. T. '90); Boston University, President Warren, Professors Huntington, Coit, and others; Boston College, President Read-Mullan; Colby College, President Butler; Columbia University, Professor Hutton; Dartmouth College, President Tucker, Professors Eastman and Emery; Harvard University, President Eliot, Professors Pickering, Norton, Peirce, Trowbridge, Shaler, and others; Holy Cross College, President Lehy; Lehigh University, President Drown; University of Iowa, Professor Russell; Massachusetts Agricultural College, President Goodell; Middlebury College, President Brainerd; McGill University, Professor Bovey; Rutgers College, Professor Chester; Smith College, President Seelye; Trinity College,



President Smith, Professor Martin; Tufts College, Professors Dolbear, Fay, and others; University of Vermont, Secretary Doten; Washington University, Chancellor Chaplin; Williams College, Professor Lefavour; Yale University, Director Chittenden of the Sheffield Scientific School; Rhode Island College of Agriculture and Mechanic Arts, President Washburn; University of Michigan, Professor Patterson (M. I. T. '88). The Franklin Institute was represented by its Secretary; the City and Guilds of London Institute, by Doctor Kennelly.

From Washington came Assistant Secretary of the Treasury Vanderlip; Superintendent Walcott, of the United States Geological Survey; Professor Newcomb; Commissioner Harris, of the Bureau of Education; Mr. Tittman, of the United States Coast and Geodetic Survey; General Kimball, of the Light-house Board.

Among other official representatives were, Judge Lowell, of the United States Circuit Court; Governor Crane; Chief Justice Holmes, Massachusetts Supreme Court; Secretary Hill, of the State Board of Education; President Smith, of the Senate; Speaker Myers, of the House of Representatives; Mayor Hart; Mr. Carter, president of the Merchants' Association; and Mr. Lincoln, president of the Chamber of Commerce.

Interesting and notable messages came from men and institutions too remote for personal representation.

The official programme of the exercises was as follows:—

#### ORDER OF EXERCISES

|  |                                  |
|--|----------------------------------|
| Organ Prelude . . . . .  | HORATIO PARKER.                  |
| Invocation . . . . .   | RIGHT REVEREND WILLIAM LAWRENCE. |
| Address, on behalf of Corporation, COLONEL THOMAS LEONARD LIVERMORE. |                                  |
| Address, on behalf of Faculty . . . .                                | PROFESSOR JAMES MASON CRAFTS.    |
| Address . . . . .  | HONORABLE HENRY CABOT LODGE.     |
| Prelude and Fugue, G minor (Sebastian Bach) . . . .                  | HORATIO PARKER.                  |
| Inaugural Address . . . . .  | PRESIDENT HENRY SMITH PRITCHETT. |

Marshals and others co-operating were as follows: Professor C. Frank Allen, Captain William Baird, Professor Arlo Bates, Mr. Edward Cunningham, Mr. Harry W. Gardner, Mr. Walter Humphreys, Colonel Frank L. Locke, Mr. Ralph R. Lawrence, Professor William H. Lawrence, Professor Allyne L. Merrill, Hon. Edwin C. Miller, Professor Edward F. Miller, Mr. James P. Munroe, Professor Dwight Porter, Professor William Z. Ripley, Professor William T. Sedgwick, Mr. Harrison W. Smith, Mr. William B. Thurber, Professor Harry W. Tyler, Mr. Ambrose Walker. The aids were Mr. Louis Derr, Mr. Charles M. Fosdick, Mr. Charles E. Fuller, Dr. Harry M. Goodwin, Mr. George L. Hosmer, Dr. James F. Norris, Mr. Samuel C. Prescott, Mr. Charles M. Spofford, Mr. Maurice DeK. Thompson, Dr. George V. Wendell, Mr. Charles-E. A. Winslow; and sixty undergraduates served as ushers.

The reception at the Rogers Building fitly closed the formal ceremonies of the inauguration.

Most of the guests from out of town sought early trains, but a few remained for pleasant reunions at the Technology Club and elsewhere.

The students, whose appearance at Symphony Hall had contributed so much to the success of the afternoon, devoted the evening to a torchlight procession, receiving a few words of greeting in passing President Pritchett's house.

Following are the addresses:—

#### ADDRESS ON BEHALF OF THE CORPORATION

COLONEL THOMAS LEONARD LIVERMORE

At the beginning of the present year the Executive Committee of the Corporation of the Massachusetts Institute of Technology, learning with great regret the wish of President Crafts to relinquish his office, found themselves facing the grave duty of choosing a successor to the line of emi-

nent men who had sat in the president's chair. The standard which they had set was a high one. Under their leadership the Institute had grown into a complex organization of nearly twelve hundred students and a hundred and seventy-seven instructors, from the modest corps of twenty-five students and five professors with which it began its life in 1865 under President Rogers, that prophet who had the imagination to conceive, the courage to project, and the genius to create this novel institution of learning.

The wisdom with which the committee should act was not to be measured by numbers alone. They did not forget that upon their choice largely depended the preservation of the intangible body of the Institute, consisting of the high traditions, the love of truth, the habit of thoroughness, the enthusiasm in labor, the devotion to bettering the condition of mankind, the *esprit de corps*, which had come into being under the influence and guidance of the Presidents of the Institute.

There was no lack of nominees for the office worthy of respectful consideration, but there was one whose qualifications were pre-eminent in the estimation of the committee. Of long experience as an instructor in science, and of eminent repute at home and abroad for scientific attainments and work, he had, at the head of the Coast and Geodetic Survey, to which he was called by the President of the United States, demonstrated his profound learning together with a genius for organization and the talent for wise control which are the essentials in the successful administration of great colleges. The Executive Committee received his acceptance of their invitation in the happy confidence that it was a great good fortune of the Institute.

In Massachusetts, whose material prosperity comes so largely from manufacturing products out of materials which

must be imported, wide and persistent technical education is essential for holding this prosperity against the competition which is sure to arise in those regions which produce the raw materials; and institutions which are to serve this purpose cannot rely upon native talent alone. They must avoid intellectual inbreeding. They must search the civilized world for the best instructors, the ablest organizers, and the most vigorous and wisest administrators. It is a good omen for the future of this Institute that its new President comes from the great valley of the Mississippi over which the star of empire stands still. It brings to Massachusetts some measure of a not unworthy revenge for the allurements to the fertile prairies of the West of so many of our best young men. If it shall result from this event that more of the young men of the West seek admission to the Institute, then, in taking a more generous revenge by returning them to their homes trained in our methods and filled with our traditions, we shall do well by our country and not ill for ourselves.

And now it is my agreeable duty on behalf of the Corporation formally to announce the appointment to be President of the Massachusetts Institute of Technology of Henry Smith Pritchett, Doctor of Philosophy and Doctor of Laws, and to express the great satisfaction with which it has received his acceptance to the office.

He has our sincere welcome. We assure him of our best wishes for his success, and we promise him our support in all that he shall do to hold here what is good and to improve what may be made better.

## ADDRESS ON BEHALF OF THE FACULTY

PROFESSOR JAMES MASON CRAFTS

I address you not as ex-President, for that title removes me from participation in the affairs of the Institute; nor can it be supposed that ex-Presidents are illumined by X-rays or by any other peculiar light in their visions of the present or in their retrospect of the past. But a mission has been confided to me, as an old-time professor of this school, as a friend and companion of its teachers, and as one who hopes always to share their interests: I have been requested to speak to you on behalf of the Faculty; and I think I shall best meet their wishes by laying before you some description of the position now occupied by men engaged in the pursuit of experimental science.

Certainly, no general declaration of views or principles is necessary on behalf of college professors. These men have shown themselves abundantly able to speak for themselves. They are filling our monthly magazines with essays upon all conceivable subjects. They are pre-eminent in giving to political questions that earnest and dispassionate study which is the highest duty of the citizen of a republic, and which is too often neglected by our men of business. They are ever more and more gaining the public confidence as skilled experts, trained to search out the truth, and little disposed by their training to conceal or misrepresent it. Their abilities and usefulness have of late years been recognized by statesmen; and the government of our country has honored itself and them by confiding to them some of its most important missions, diplomatic and administrative.

On the other side the seal is set to this public recognition of their capacity for good citizenship by the enmity

which they excite in the minds of a certain class of political workers, who are loudly telling them to let practical affairs alone, to go back to their libraries and their class-rooms, and there to pass their time in silent and harmless meditation. If these gentlemen had their own way in all things, they would condemn the professor to something approaching that carthusian retirement described by Richard de Devizes in his story of the third crusade,—the same chronicle from which the good Sir Walter borrowed a part of the plot of "The Talisman." The chronicler says in his preface that on a recent visit to a monastery near Winchester he was surprised to find that the Carthusian monks were obliged always to keep open the door of their cells, to signify freedom to leave, while they were forbidden by their rules to put more than one foot outside the door. The only choice allowed them was the selection of the foot which they might wish to put outside.

If it is thought that the professor is not a practical man, because he belongs to the small class which has carried its education to the highest limit, we bring forward the testimony of our own school, to show that it is a most practical thing to enroll one's self in that class which seeks the highest education. It is an investment which brings in the quickest and surest return. If it is supposed that teachers are chosen in this class from the men who are least enterprising, this is also a mistake. We know well that, at least in scientific branches, opportunities are not wanting to leave teaching for business careers of all kinds with higher pecuniary rewards; and, if they are not accepted, it is because the professor loves his work.

At Cornell University many years ago we had an amusing instance of popular misconception (I do not know how generally shared) of the teacher's position. A student who

had not done well in his examinations petitioned the Faculty to be granted his degree because, as he said, "He only wanted to learn a little, just to teach it." It is needless to add we did not further his wishes, nor aid him to become a teacher on these terms.

But teachers need eulogy as little as they need explanation. Wherever their pursuits, as historians, economists, teachers of religion or of art, have brought their researches and conclusions within the usual current of men's interest, they have been listened to with attention and respect. The audience, however, becomes very small when facts and theories are presented which have no relation to the dealings of man with man or which do not point to man's immediate or future destiny. In other words, the aims, purposes, and interests of the strictly experimental sciences, are little understood and little appreciated by the general public; and yet it is precisely these sciences which have made the most striking progress in this scientific age, and which have helped all other efforts of human thought to whatever authority they may have attained through habits of exactitude, honesty, and investigating skill.

Let me take advantage of your presence here, which betokens an interest in a scientific enterprise, in order to bespeak your attention to some features of our work which seem insufficiently known to the public at large. I shall confine myself to this subject because I understand that the educational work of schools of applied science and their relations with the industrial world are to be fully set forth by another speaker.

We who are pursuing Engineering, Physics, Chemistry, Biology, etc., would like to have you take the same profound and critical interest in our work which you are willing to give to ethical or artistic subjects. We think that

you are interested in our results, but not in our methods. You have ever before you splendid and admirable achievements visible in the bridges which span our rivers, the steamers which cross the ocean, the railroads, the telegraphs and telephones which bring man nearer to man, the sanitary engineering which gives health to our cities, and the iron furnace which supplies the material for all these works. You use them, you wonder at them for a day or an hour, and then custom makes them as expected as the rain or sunshine; and you expend little gratitude on those ingenious men who are fulfilling your most extravagant wishes with a prodigality never dreamed of by an Arabian magician. Your imagination never stretches out to a full conception of the effort and courage which have gone into these inventions, and still more into the good discipline of the army of workers who have elaborated the great system of organized scientific thought by which for the first time in the history of the world each man may pile his contribution upon a sure foundation and the next comer may add his block to the edifice without one fault of construction or ill-adapted piece.

You are willing to listen to the geologists because their story is simple as it is magnificent in its description of the grinding of the Lord's slow mill, but perhaps you have been most interested by the theology which you hung upon geological data. Biology, the science of life, in all its branches has its living attraction for you; but here also you have got out of the doctrine of the origin of species more theology than science ever put into it.

When we have only to tell you of things and their relation to each other, your interest lessens, and you turn with a much more kindly ear to the story of man's doings; and yet the beginning of the new and better scientific knowledge



lies in the treatment of inanimate matter. Things are simpler to handle than living beings, and the rules of procedure which we learn from them stand us in good stead when we approach the more complicated investigations concerning beings animated with life and concerning man himself.

You have not yet disabused your minds of the doctrine of the Greek philosophers, that man is the only worthy study for man. We can see in the modern world some traces of the charming classical instinct which rejected bare facts and translated them into myths. The first observations in astronomy were made by some keen-eyed shepherd, who watched the phases of the moon as he tended his flocks by night. The gossips of the day used his confessions to steal away the reputations of the shepherd and of a goddess, and the poets have transfigured the story into the loves of Diana and Endymion.

An astronomer can nowadays stay up late at night without losing his reputation; but what poet shall tell us of his sublime conversation with those solemn orbs "that utter forth a glorious voice" and give us a legend as lasting as the human race?

The outlook in this direction is even less encouraging now than formerly. Milton, while in Italy, made a pilgrimage to visit Galileo. His poetry is full of allusions to the Galilean philosophy. He perfectly appreciates the beauty of the mathematical measurements which fix the stars in their orbits. He finds the system more picturesque than Ptolemy's heaven of brass, which he pithily and somewhat disdainfully describes in "Paradise Lost":—

"With centric and eccentric scribbled o'er,  
Cycle and epicycle, orb in orb."

In the eighteenth century, certain poets and the men of

literature were well acquainted with the science of the day, and would have felt shame at not knowing it, till knowledge and poetry culminated in Goethe, who knew all things and was a successful scientific investigator as well as a poet.

A decided step backward has been taken in this century. Wordsworth held it to be his mission to bring all things within the scope of poetry, to grasp the highest and stoop to the humblest,—so humble that Taine, the great French critic, says that he might as well have drawn a moral lesson from an old tooth-brush. Like all country gentlemen, he held himself to be a statesman, and his meditations made him a philosopher; and yet this all-embracing poet omitted science from the scope of his work, while science was the chief factor that was changing the current of men's thoughts. Shelley tried his hand at it occasionally, but his science was very erratic; while the few lines which Tennyson has given to scientific conceptions are such excellent models of the terse beauty of perfectly accurate statements that we wish that they had been more frequent. He is capable, however, of sometimes treating us unkindly, as when he makes the lover of Maud say:—

“The man of science is fonder of glory, and vain,  
An eye well practised in nature, a spirit bounded and poor.”

But the next two lines are equally unkind to poets:—

“The passionate heart of the poet is whirled into folly and vice.  
I would not marvel at either, but keep a temperate brain.”

The complication of scientific facts and theories is certainly an obstacle to their popular presentation; for that which makes the deepest impression is the sublime treatment of some very simple idea, and it must be recognized that the invention of the form of presentation may be quite as worthy of praise as the discovery of a new idea. To use

a scientific phrase, energy is imparted to one of our plain thoughts when it returns to us after it has received an impetus from the mind of genius and has been set to the music of beautiful words. We have all seen sunrises; but who before Shelley ever saw

"The sanguine sun rise with meteor eyes  
And burning plumes outspread" ?

The request which we make to men of letters is that they shall imitate their great predecessors, and shall make themselves acquainted at first hand with the most honest, the clearest, the most fruitful movement of human thought. The material is ready for their use, and it does not seem unattractive for literary treatment. Let me cite in example of such treatment a phrase from Tyndall: "I believe my thoughts lay incipient in a burning cloud."

Nor does the present moment seem unpropitious for proffering such a request; for we have reason to believe that, after passing through the complications of research, we are nearing a period of more general conclusions. The great, simplifying discoveries of Galileo and Newton tended doubtless to make the philosophy of their time popular; and now again there is reason to hope that a new outburst of popular interest may follow if a capital discovery is made regarding the law of the attractions of the molecules. Some formula simple as that of the attraction of gravitation would explain and harmonize all the laws of chemistry and physics. Until the master mind has uttered itself, we do not know whether our collection of knowledge is already sufficient or whether some new path must be struck out; but the light is growing and we are walking in hope, believing that the dawn is nigh.

It need not be said that we do not insist upon always

having poets for our interpreters, and I feel safer in stepping from the cloudy splendors of poetic regions upon the firm ground of prose; but even scientific prose need not be dull, and here in a notable way the true and simple story of an achievement is more picturesque than the legend which may grow up about it.

Many persons will tell you promptly that Newton discovered the attraction of gravitation by watching and meditating upon the falling apple; and it may surprise you to learn that the most stately and least scientific of kings, Louis XIV. of France, gave Newton more aid than did the apple-tree in making his great discovery. Although the dates are uncertain and the documents imperfect, the best accredited story is a dramatic one, and illustrates at the same time the scrupulous patience and the burning enthusiasm of the man of science. After Newton had concluded that the attractions of bodies in proportion to their masses and inversely as the squares of their distances would explain the movements of the heavenly system, he tested his theory by calculating the orbit of the moon. The dimensions of the earth entered into the calculation; and, using the old measures which gave about sixty miles to the degree, the result showed an error of about one-eighth in the calculated orbit. He could not publish a thing which was not sustained by facts; and for seventeen long years he laid it aside, waiting for its vindication by truer knowledge. About 1682 he went up to London, and heard at the Royal Society that Picard had published a new measurement of an arc of the earth's circumference, ordered by the French king, and found sixty-nine miles to the degree. He hastened back to Cambridge to use the new figure in his calculations, which went on late into the night; and at last, as the result seemed to approach exactly to the true orbit, Newton grew

so excited that his trembling hands could not hold the pencil, and he had to call in the aid of a friend to complete the sum.

We have seen in our day a more tangible, but not more dramatic instance of the coincidence of calculations with practice. The first great mountain tunnel through the Mont Cénis was begun at both ends. The workmen in France began to hear the sound of tools on the Italian side. The drills had been directed by triangulations carried over rough mountain sides, and a failure of a few feet in ten miles meant disaster for the contractor. When at last the drill-holes were pushed through and coincided, so that hands were shaken between two kingdoms, the anxious work of the contractor received its crown, and a shout of applause went up throughout the world.

The newspapers frequently give us true accounts of the progress of science, and there is no need to bespeak the attention of the press for scientific events. The editors of daily papers seem much inclined to view industrial achievements with strong interest, and they are often at considerable pains to get reports of them quickly and at first hand; and I may add that, so far as my observation goes, it is to the credit of the reporter's skill that he usually states scientific propositions correctly, even although he may be unfamiliar with the language and methods of science. But the note-books of reporters need more editing; and it is to be regretted that conversations with sanguine inventors and promoters, who tell not what they have done, but what they hope to do, should be allowed an equal place in the columns of scientific news with the accounts of things accomplished. The reader confuses the two classes, and involves them both in his very reasonable doubts.

The technical journals are well informed and are quite

capable of criticising pretensions to new inventions ; and they offer an excellent and well-digested source of scientific information, so that the reader need not go to the fountain-head — a somewhat dry fountain — in the journals of learned societies.

While speaking of our friends the newspapers, it is fitting to thank them for their good offices in making educational work so well known ; and I think that this is one of the channels by which aid is brought to us.

We are always poor, although last year thirty-three millions of dollars were given by private individuals to colleges, universities, and technical schools in the United States. This great sum came through strangely diverse channels, and the heads of our best institutions will testify that little of it came by begging.

The largest gifts, measured by millions, came from patrons of universities who had long been interested in them, and who knew when and how to give ; but very large sums, in hundreds of thousands of dollars, came from most unexpected sources, without solicitation, as the result of the well-considered charity of the donor, and were a testimonial to the public good reputation of the schools.

Very frequently these large and spontaneous gifts were not from scholars, but from men who spent their money to educate other men's children, for the very reason that they had not received a liberal training, and they knew so well the painful effort entailed by the want.

This care of our institutions by private individuals is a very republican proceeding, and the best men in the State are willing to add to pecuniary donations the very great gift of their active and faithful services.

It may be that this practice in higher education has suggested to the government of the commonwealth the policy

which works so well, of securing the services of business men who would be unwilling to take other offices, but who are willing to care for our parks and to superintend the construction of great public works.

The men who form the corporations and executive committees of our institutions are in very closest touch with the most active and public-spirited class in the community. They bring to bear upon the expenditure of money and the shaping of educational policy the shrewdest business talents and the liveliest sense of the needs of the time, and the results in economy and enterprise compare most favorably with the treatment which the educational problem receives from the hands of the trained officials of Europe. We must not let our success, however, blind us to the fact that we have still much to learn from the older system.

I cannot forbear adding in this place a few words of affectionate remembrance concerning one public-spirited citizen whose loss we all deplore this day.

Mr. Augustus Lowell was not only closely connected with the Institute as one of the members of our Executive Committee since its foundation, but he was also in close relation with the Faculty as trustee of the Lowell Fund, which, besides the more popular lectures, provides each year for twenty separate series of free lectures upon science, which have been given by members of our instructing staff chosen by Mr. Lowell. He was a man courageous, active, and conscientious, taking the performance of duty and sometimes the unpleasant side of duty, as a matter of course. Upholding an honorable family tradition with singular energy and industry, he devoted himself as few private individuals have done to the careful study of educational questions both in connection with our own problems and with the difficult work of providing sound and entertaining matter for popular lectures.

Faithful and persistent in his friendships, quickly decided and tenacious in his opinions, Augustus Lowell lived and died a man of mark in the community.

As my mission is to speak *for* the members of the Faculty and teachers, consideration for their modesty restricts me in what I can say *of* them. I cannot follow them as far as I could wish into the class-room, nor dwell upon their comradeship with the students, their endeavor to form character and to build up that knowledge which is power; but I will allow myself to say one thing with reference to the character-making qualities of our whole system, and to show that such work can be done, and well done, outside of the class-room of ethics or moral philosophy, and even without the aid of the cricket or the football field.

First, in any system of education in art and science by means of work in drawing-rooms and laboratories, a large number of teachers must necessarily be employed for a given number of scholars; and this requirement is adding enormously to the cost of education in applied science, which is very different from education by lectures.

A close companionship is the result, and, with the class of students who come to us, an eager desire for acquisition, an early and clear conception of the goal aimed at, and the prevailing conviction that a man would better work in school in the same way that he will have to work afterward—all these things lead to little necessity for spurring on or for restraint of discipline, and open the field to the best influences that a teacher can bring to bear upon a student.

These influences naturally depend upon character and close intercourse. But what I wish particularly to say is, that in a school of applied science a third element is po-



tent, perhaps most potent, in its effects upon character; and that is the obligatory truthfulness of scientific work. We have no use for lying or any misrepresentation; and, more than that, our chief endeavor is to learn the difficult art of seeing and proclaiming the exact truth with no reference whatever to consequences.

Doctrines, selected, interpreted, and modified according to their supposed consequences, are good for campaigning purposes, but are not admitted in scientific reasoning; and they are very apt, in the end, to become false doctrines.

It is a very simple and straightforward life that is led by a scientific investigator and teacher; and the young man who passes four years beside him, who catches his spirit, and who honestly and earnestly tries to learn his modes of work, is under very good influences.

It may be added that the occupations described lead to harmonious working, and we can assure the newly-elected President that he will enter into a house in order.

You, sir, have from the Faculty the same hearty greeting that has been offered to you by the government of the Institute.

They welcome you as a man who has trod the same path as themselves, who knows the joys of discovery, or even of unsuccessful research, as well as its disappointments and long-sustained efforts.

They welcome you as a teacher familiar with the great responsibilities of that high office and of its precious opportunities for meeting young men at the time when they are forming their ideals of life.

You will meet with the great body of the Alumni, and oftentimes you will hear some word of gratitude, and a man will tell you how he has walked in the way pointed out to him here:—

"The happy warrior . . . who, when brought  
Among the tasks of real life, hath wrought  
Upon the plan that pleased his boyish thought,"

I am very confident when I predict for you, in the opening of a new epoch of your life, an agreeable situation; for I speak from my own recent experience of a short term in the same office.

You will receive from the Executive Committee and Faculty judicious support and judicious opposition, and both one and the other will be frank and friendly.

I fancy that in the high governmental position which you have quitted conditions may have been more complicated. Here, at least, they are very simple; and, while walking along the same straight road with the Faculty and teachers of this school, I predict for you precious opportunities for companionship and friendship, and I can wish you no better wish than that you should repeat the experience to which I look back with the greatest pleasure.

#### ADDRESS

HONORABLE HENRY CABOT LODGE

I feel much honored in being permitted to take part in these inaugural ceremonies. It is a privilege which I highly appreciate, and which gratifies me both on public and private grounds. I am glad to share in this occasion, so important to the Institute of Technology, in which, in common with all citizens of Massachusetts, I feel so much pride. It is a personal gratification also to escape for a moment from the heat and turmoil of a political campaign, where there is much distortion of facts, into the cool, calm atmosphere of science and learning. Pleasant, too, is it for

the much criticised to have the rare opportunity of speaking to some of his critics, for the often lectured to stand for a moment in the place of the lecturer.

The act which you perform to-day is one of grave importance, and it is the significance of that act which I would fain make the theme of the few words I shall say. You are about to inaugurate formally a new President of the Institute. Very fortunate is that man to whom it is thus given to stand at the head of a great institution of learning; for to him have come those things which are most to be desired by strong men,—work worth doing and a great opportunity. He is a builder: he is shaping the unknown future. Nothing can be finer than this, for it is far better to create than to destroy. To him is confided in part the young life of the country. Presidents and professors grow old and pass away, the catalogue lengthens, and great names shine out upon it as the stars begin to burn in the heavens after the setting of the sun; history and traditions gather as the years flit past, the walls of the buildings grow gray and mellow beneath the touch of time; but the college itself is ever young. Eternal youth is always there, as the succeeding generations come and go. To the president of the college or the institute falls the task of moulding and leading all these young lives marching along in unending procession. He is their chief, their leader, their captain. It is a responsibility as noble as it is great. Napoleon said, "I have no bad regiments: I have some bad colonels"; and, as a bad colonel ruins a regiment, so a bad president can turn awry the whole life of a college, and thus affect for ill the future of his country.

In some respects the duties of the head of any great institution of learning have changed with the vast growth of our colleges and universities. He is no longer primarily

a preacher or an instructor. He must be, first of all, a leader of men and an administrator. He no longer is himself a teacher; but he must, like Bacon, take all learning for his province, and provide that in every branch and in every department there shall be the best teaching and the most skilled masters. In another respect, and that the most important, the highest duty of the instructor of youth is the same now as it has always been, and falls alike upon all who teach, from the schoolmaster among his boys to the chief of the great university. This highest duty is not easy to define. No laws prescribe it, no formulas explain it. It is the influence which the chief exerts, the tone he gives, the spirit he inspires, the impression he makes. Vague as it is, however, it carries with it in its fulfilment all the difference between success and failure. Impalpable and unseen, it is yet as necessary to the life of a college as the air of heaven is to our physical life. The powerful rhyme of the poet outlasts the gilded monument of princes, habits of thought endure through centuries which sweep away the mightiest buildings raised by men; and so the personal influence of the leader is felt throughout the lives of those whom he has led in the first flush of their youth.

"There were tones in the voice that whispered then  
You may hear to-day in a hundred men."

That which is beyond the ken of book-lore or microscope lies in the personal influence of the commander. The soldiers may be all equally well drilled, they may be armed and uniformed alike, of the same quality of blood and race and courage; and yet one regiment will cast itself into the imminent and deadly breach, carrying all before it in a victorious charge, while another loiters and hesitates. There

are no bad regiments : there are some bad colonels. From a college or an institute students may go forth filled with the spirit of their time and country, ready and eager for battle, the light of hope and victory in their eyes, or they may come out into the world's strife doubters, critics, scoffers, fault-finders, fit only to linger in the plain while their comrades scale the heights. It is not the winning or the losing that is important, but fighting the good fight in the great world of action. The men who have caught the inspiration of the real leader may plant their flag upon the ramparts or they may let

"The victors when they come,  
When the Forts of Folly fall,  
Find their bodies at the wall."

In either event the world is better for their having lived in it ; and as for the other sort, who never charge at all, but merely know how the charge ought to have been made, it matters little whether they have lived or not.

What, then, are the vital qualifications for the leaders of American youth ? They are four, I think,—high character, ample learning, proved executive capacity, and the training and experience of a man of the world in the best and broadest sense. As to the first three requisites, all persons will, I think, agree. The need of the last qualification is not, perhaps, quite so obvious ; yet it is absolutely essential if the head of the great institution of learning is to imbue his students with the right spirit, and send them out to play in the world a part worth playing. Every great position has its peculiar perils and temptations. To this rule, and I say this with the utmost deference to those I see about me, the presidents of colleges and institutes are no exception. The dangers to be shunned by men holding these

great and responsible offices is the conviction, which easily arises, that the college world is the whole world, and that university and universe are interchangeable terms. It is a grave misfortune to the country as well as to the institution itself when the onlooker, turning to its chief for precept and example, is reminded of Pope's satire, and cannot refrain from murmuring to himself:—

“Like Cato give his little Senate laws,  
And sit attentive to his own applause.  
Who would not laugh if such a man there be ?  
Who would not weep if Atticus were he ?”

When intolerance or narrow views possess the chief, it is certain that the spirit and the tone impressed upon the students under his care will not be the right ones. Their critical faculties may be sharpened, but their enthusiasm and hopes will be chilled. Their self-complacency will undoubtedly be enhanced, but their effectiveness will be sadly diminished.

An experience in the world of men and in large affairs is the surest armor against this dangerous and hurtful frame of mind. In the world-school any being not wholly dense learns that difference of opinion does not necessarily mean that he who differs from one is either knave or fool, or both. To any open-minded man experience in the great arena of action brings understanding, if he is of the right fibre, of the life of the time and of sympathy with it. He comes from that teaching to feel with Fra Lippo Lippi that this world is not a blot or blank, but means intensely, and means good.

Let me turn from general propositions to a concrete illustration of my meaning. In the gentleman whom you inaugurate to-day as President of our great Institute of Technology, the high qualifications which I have enumerated as

necessary for such a place all meet in happy combination. He has high character, generous learning, an assured place in the domain of science. He has proved his executive capacity by his successful administration of a great government survey. He has lived in the world of men, labored with them, fought against them, learned that liberality and toleration are not incompatible with an unflinching opposition to wrong, learned also to do justice to opponents, become convinced that it is better to get the best possible than to prate idly about an impossible perfection, find fault perpetually and get nothing. The ignorance of the cloister can never dim the knowledge thus acquired, nor harsh and narrow prejudices warp a judgment which, while it is keen, is also just. He brings to your service and to the broader service of Massachusetts and of the country all these high qualities. He will send forth his students imbued with his own faith and hope, in harmony with the spirit of the time and the spirit of America. No man, I am sure, will rival him in devotion to his charge or in his admiration for it. But he will not forget that the little world he guides and rules is part of the greater world of the United States, borne on the mighty current of the national life as the tides of ocean bear the ship, and that he who serves the country best, in training her sons, best serves the noble institution committed to his care.

INAUGURAL ADDRESS  
THE EDUCATED MAN AND THE STATE

PRESIDENT HENRY SMITH PRITCHETT

I should fail to do justice to my own feeling did I not pause for one moment to acknowledge the kindly greeting which has just been extended to me at the beginning of my life among you. For the words of encouragement which have been spoken, for the assurance of co-operation and support, for the cordial personal welcome, I am more grateful than I can say. The response to such words and to such welcome is not to be made at this time and in this place. It can be given only in the years of service which lie before us.

It was my fortune some years ago to pass from a university place to that of an executive office of the general government, to go from the work of training students to a corps of men who were recruited almost wholly from the ranks of college graduates. In the attempt to secure for the government service men of the best training, the relation of the educated man to the government, whether as an employee or as a citizen, has been a matter of immediate practical consideration. In such a position one studies the output, if one may use that term, of our universities and of our colleges from a different point of view from that which the teacher occupies. He measures the college man in comparison with other men, from the standpoint of his ability to do things, and not from the standpoint of his knowing how to do things.

The two points of view are very different, and for this reason I have deemed it not entirely without interest to say a word to you at this time concerning higher education



in relation to the government, and more particularly to consider the part which educated men are to-day taking, and ought to take, in government; the obligations of the higher institutions of learning to the State; and, finally, to discuss briefly the question whether these obligations are being fairly and honestly and intelligently met.

There is a saying which is current in the student talk of German universities to the effect that of those who enter the university doors one-third breaks down and one-third goes to the devil, but that the remaining third governs Europe. Such expressions are oftentimes more apt than true; yet, on the other hand, they sometimes represent a popular conviction more correctly than formal tables of statistics, just as a bit of floating straw shows the direction of the current more truthfully than the powerful cruiser. Unfortunately, it is not easy to subject such a statement to accurate examination. The statistics of the unsuccessful are necessarily far more incomplete than the statistics of those who attain prominence. The devil keeps no books; or, if he does, they are not open to the examination of the student. But it requires only a limited study to show that the last part of the statement is certainly true, at least so far as Germany is concerned. The educated man, trained either in the university or the polytechnic, governs Europe to-day.

No one connected with the government of the United States in any executive capacity can fail to see that the government of this country is also passing rapidly into the hands of educated men. The population of the country at this time is approximately 76,000,000 of people. The number of college-trained men is perhaps less than one per cent. of the population. From this small percentage, however, are filled a majority of those legislative,

executive, and judicial places of the general government which have to do in any large way with shaping its policy and determining its character. Not only in the ordinary positions of the government service is this true, but the government is calling more and more frequently upon the educated man for the expert service for which his training is supposed to fit him, and this not only in the relation of scientific experts, but in all other directions in which the government seeks the advice and the assistance of trained men.

On the other side of the Pacific a commission of five American citizens has undertaken the most delicate, the most difficult, doubtless the most thankless task in the establishment of civil government to which any group of our citizens has ever devoted its unselfish efforts. It is a significant fact that a majority of that commission are college professors.

The presence, in constantly growing numbers, of educated men in government service means also the displacement of an increasing number of poorly trained men. It is the old story of the untrained against the trained man, and to-day the world recognizes that the day of the untrained man has gone by. In the service of the government, as in all other fields where intelligence and skill are factors, the educated man is displacing from the higher places the one who has no training or who has a poor training. Whether wisely or unwisely, whether for good or ill, it may be accepted as a fact that the government of this country is passing rapidly into the hands of the educated man. It is a matter of the highest practical importance to inquire whether the man who is coming into this power is worthy of it, and whether the training which he has received in the college or in the technical school is given with any purpose of fitting him for this trust.

Before approaching this question, it may be well to call to mind the attitude of the government of the United States and of the State governments toward higher education and toward scientific investigation.

Notwithstanding the crudeness of our legislation, it is still a fact that Congress and the State governments of the United States have been generous in gifts to higher education and to scientific work. The gifts of the general government have come from the sale of public lands. To the separate States has been left, heretofore, the power to lay taxes for the support of institutions of higher training. It is difficult to bring together the data for a trustworthy statement of the value of all these gifts, but they aggregate an enormous amount. At the present time the federal government is devoting more than ten millions annually to the work of the scientific departments of the government. At the very beginning of organized government in this Commonwealth the question of education was one of the first with which the State concerned itself. The principle of State aid to higher education, then recognized, has been since that time accepted by the general government and by every State government. In New England, Harvard and Yale and other foundations of higher learning are now dependent upon private endowments; yet almost every one of these has at one time or another received State aid. Harvard was in reality a State institution, having received from John Harvard only £800 and 320 books. And, while the more generous gifts to New England colleges have come from private sources, they have never hesitated, in time of emergency, to come before the representatives of the people and ask for assistance. These petitions have never been disregarded by the State. The American republic may fairly claim to have adopted and to have fol-

lowed out Macaulay's motto,—“The first business of a State is the education of its citizens.” In no land and in no time has the State responded so quickly and so generously to the demand for higher education as in the United States of America during the last half-century.

If this aid had been rendered by an individual, if one could imagine the spirit of the whole people, both State and national, incarnated in a personal intelligence which should take cognizance of the obligations of those whom the State had befriended, I can imagine that one of the most direct questions which such an intelligence would address to those who direct the education of the youth would be: “I, representing the whole people, have given you freely of my national domain, the heritage of the whole people. I have founded and supported colleges and universities and technical institutions. What direct return has been made to me for this assistance, and have those who control the training of the youth kept in view their obligation to me and the dignity and the needs of my service?”

The question is a perfectly legitimate and a perfectly fair one. And, while it is easy to answer it in generalities, it is not so easy to give a reply of that definite sort which shall lead somewhither. The subject is too large and has too many ramifications to be discussed on this occasion in full. Perhaps the best I can do is to call attention to the importance of the inquiry itself and to the obligation which exists for a definite, full, and, most of all, an honest answer. In addition, I shall endeavor to point out certain directions, in which, to my thinking, the ends of the government have been well served in our system of education, and certain others in which, it seems to me, we need improvement.

It seems to me that it may be stated as a general result

that the State (using that term to characterize both the general government and the State governments) has been well served by the institutions of higher learning. It can be shown satisfactorily that in the main these institutions have not only served the general purpose of the diffusion of knowledge among men, that they have trained men in such a way as to make them more effective in the pursuit of their own fortunes, but also that they have given back to the State men well trained to serve it. There can be no question that, judging by the general result attained, the expenditures of the State for higher education are justified by the result, and that the harvest which the State is to reap from its investment has only begun.

Notwithstanding this general outcome, there are certain directions in which the State may reasonably demand additional results. The State represents, as does no other agency, the whole people; and, in considering the obligations due the State and the best method of discharging them, we must remember that the institutions of learning are attempting to serve, in the most direct and at the same time in the broadest way, the whole body of citizens.

One thing which the government has a right to expect of those educated in the higher institutions of learning is a decent respect for the service of the State.

I am sure I express the sentiment of all men of serious purpose who have stood in executive places in Washington when I say that there is no greater source of discouragement to those who are honestly striving for good administration than the facility with which good and honest and intelligent men will ascribe the worst motives to those in government office.

There is a feeling—and it finds expression perhaps

more often in our institutions of learning than elsewhere — that, although a man may be perfectly honest the day before he goes to Washington, he is to be suspected of any crime the day after ; and the discouraging part is that the record of a whole life of consistent devotion to duty is no defence whatever against the most sensational accusation. Again and again a man of pure life and of high purpose, who has accepted a post under the government, discovers with infinite pain and surprise that the silliest charge against him is accepted, not only among the idle and the curious, but by those upon whose support he had most counted. This tendency is not peculiar to our time or to our nation. It is part of “that touch of nature which makes the whole world kin,” — a kinship as universal as it is detestable. One cannot think of the failure to discriminate between the dishonest few and the honest many, of the courage brought to failure by well-nigh universal suspicion, of the unmerited pain, from Washington’s day to this, inflicted by the careless judgment of men’s motives, without recalling the words of Edmund Burke : “It is very rare indeed for men to be wrong in their feelings concerning public misconduct ; as rare to be right in their speculation upon the cause of it. I have constantly observed that the generality of people are at least fifty years behind in their politics. There are very few men who are capable of comparing and digesting what passes before their eyes at different times and occasions so as to form the whole into a distinct system. But in books everything is settled for them without the exertion of any considerable diligence or sagacity. For which reason men are wise with but little reflection and good with little self-denial in the business of all times except their own.”

Let me say that no man can be brought into contact with the actual machinery of our government, can mingle

with the men who make our laws, who interpret them, without gaining not only a wholesome respect for the service of the State, but also a reasonable hopefulness for the future of our institutions.

So far as my judgment goes, there are few conventions of men brought together for any purpose in which the average of intelligence and of honesty is higher than in the American Congress. It goes without saying that its members are influenced by personal considerations, by social ties, by all the things which move men,—in other words, they are human,—but it is a gathering of men who honestly desire to do the right thing. It is the fashion to speak of the honesty and the intelligence of the good old days when the republic was young and when statesmen were pure, and to deprecate the decadence of the present day. Such talk is the purest nonsense. The general intelligence of the body of Congress is higher to-day than it ever was, and its conscience is quite as acute. Unfortunately, the work of quiet and serious men receives little attention from the public, although these men count enormously in the actual work of legislation.

Let me illustrate with a single example. Two of the most important committees in the House and in the Senate are the Committees on Appropriations. Imagine for an instant the enormous number of objects for which a government spends its money. Consider the wide range of subjects which the demands for money cover. Imagine, if you can, the patience and the judgment and the honesty which are involved in holding the purse-strings of the richest nation on earth, and the difficulty of deciding upon the wisdom of requests which range from the demands of abstract science to the promotion of the interests of some small neighborhood. Think for a moment what an oppor-



tunity for men who are disposed, even in the remotest way, to dishonest practices, and, having considered all these, take into account the following facts: The chairmanships of these two committees have for ten years past been practically in the hands of four men, two Republicans and two Democrats. During that time these committees have had in their hands the allotment of a larger sum of money than was ever controlled by any body of men in any nation at any time of the world's history. These men are to-day either poor men or in the possession of modest incomes made from their own exertions; and so honestly and so carefully have their duties been performed that not the slightest insinuation of wrong-doing has ever been made.

In the executive branches of the government as well, one will find a quality of service to command respect. There are incompetents in greater numbers than one could wish; but, since the civil service law has made it possible for men of education and of energy to find a career in government service, the quality of men entering it has steadily improved. And, notwithstanding the half-hearted service of the few, it is true that the government receives quite as much of devotion and of unselfish service as one can find in the ranks of those engaged in private business. It is the presence of this large number of devoted and intelligent men which makes the machinery of government run smoothly and which brings out the results. That this class is growing relatively larger in the service of the general government, and that the ideals of duty which are held up before them are becoming higher year by year, no one can doubt.

The government of the United States is honestly conducted. Its condition furnishes to those who know it best the basis of a rational optimism as to the future of demo-



cratic institutions. In its service, men of education should find, in increasing numbers, careers of the highest usefulness and of the highest dignity.

Another quality of the education given to the youth upon which the State has a right to insist is its catholicity. In the matter of education the State makes no distinction. It aims to make its highest training accessible to the humblest as well as to the most aristocratic. No system of education is a good one for a free State in which the students and graduates of its institutions of learning get out of touch with the great body of their fellow-citizens. Such a lack of contact between the men of education and those who lack education brings about a feeling of distrust as between men of two distinct classes. Under such circumstances the educated man is likely to lose the perspective concerning social facts and tendencies, and to become suspicious and narrow; to feel that the country is fast going to the bad, and that the advice and service of the educated man are not properly appreciated.

One of the practical results of this feeling has been that the college man has not always realized that he was to take his place side by side with the man who had no college education. He has been inclined to forget that he must expect to begin where the uneducated man begins, and that his education is not a mark to distinguish him from other men, but a training which ought to enable him to do his part of the world's work better than the man who lacked this training,—in short he ignores the fact that he is not one whit better and is to receive not the slightest consideration because of his better opportunity.

It is the protest against this feeling of superiority, whether real or imagined, which is at the basis of most of the objections now offered to a college education as a practical prep-

aration for the active work of life. The feeling is expressed in the following words from the late Collis P. Huntington. In a magazine article published just before his death, entitled, "Why Young Men Should Not Go to College," he says: "Somehow or other our schools, which teach young people how to talk, do not teach them how to live. It seems to me," he writes, "that slowly, but surely, there is growing up a stronger and stronger wall of caste, with good honest labor on one side and frivolous gentility on the other."

In so far as this charge is true,—that a college training tends to make those who receive it a class apart, and prompts them to make extravagant demands,—in just that proportion is it a fair criticism of our system of instruction. We have a right to expect that the college-trained man, more than any other, shall be tolerant and patient; that he shall understand, as no one else can, that truth and honesty and virtue belong to no age and to no nation, that they are the property of no party, of no sect, and of no class. And we have a right to expect that, realizing this, he shall have healthy views regarding human nature. If the college atmosphere does not encourage all this, then the college atmosphere needs quickening.

How far this criticism has been justified in the past I do not feel able to say. I do believe, however, that the college spirit of to-day is wholesome and catholic, that the men in the higher institutions of learning are in closer touch with the great body of mankind than ever before, and that men who go through college and take their places in the world do so in accordance with the rules of common sense.

But beyond all such questions, and including them all, is another in which the State is vitally interested; and this concerns itself with the quality of citizenship which our sys-

tem of education is adapted to produce. This I hesitate to approach, since to discuss it is to open the whole question as to what the object of education is and what subjects should be taught to accomplish that object.

It is the old question which has been discussed for twenty-five hundred years, and never more vigorously than during the past decade. However we may have improved the methods, we have certainly never been able to state the questions involved more clearly than the Greeks. Listen to Aristotle. He writes: "What, then, is education, and how are we to educate? As yet there is no agreement on these points. Men are not agreed as to what the young should learn, either with a view to perfect training or to the best life. It is not agreed whether education is to aim at the development of the intellect or of the moral character. Nor is it clear whether, in order to bring about these results, we are to train in what leads to virtue, in what is useful for ordinary life, or in abstract science."

These are the questions which have formed the basis of discussion during the last quarter-century among those interested in education, except that education for the development of character has been less talked about. Could any modern writer state the questions more aptly or in fewer words than Aristotle?

Is education to have for its object the training of the intellect, or is it to aim at the development of character, or is it to undertake both objects? And, if the character is to be developed, what are the formal means which are to be used in this development?

These questions have been asked anxiously since systems of education had their beginning. In our day they seem to have settled themselves, so far as the practical efforts of the universities and colleges are concerned, by a process of

exclusion. It is tacitly assumed at present that education—like all other training—has for its end the acquisition of power. In order to acquire power quickly, the whole effort in modern education is directed toward the training of the intellect.

There is no disputing the fact that the educated man has in the world, by reason of his education, a higher potential. Is it equally true that he has, on the average, a stronger and higher type of character? Is the college man broader in his sympathies, more tolerant, more courageous, more patriotic, more unselfish, by reason of his life within the walls of a university or a technical school? Are the men who come each year, in ever-increasing thousands, from the college doors, prepared to shoulder more than their proportionate share of the burdens of the State and of the country, or are they provided with a training which will enable them more easily to escape its obligations?

It is, of course, not easy to compare the relative moral worth of men, and say that one class is, on the whole, more useful than another. But, whatever our system of education is doing or is leaving undone in the development of character among its students, the State is saying, in terms which are becoming every day more emphatic, this:

“However desirable it is to train the mind when it comes to the service of the State (if, indeed, the same is not true in all service), character is above intellect. It is vastly important to the State that her servants shall be quick, keen-witted, efficient; but it is absolutely necessary that they shall be honest, patriotic, unselfish, that they should have before them some conception of civic duty and proper ideals of civic virtue. Give me men,—intellectual men, learned men, skilled men, if possible,—but give me men.”

This is the old story. It is the lesson which every age

preaches anew to the age about to follow. Shall we ever learn it? Will it ever come to pass that in our system of education the development of character will go hand-in-hand with the development of intellect, when to be an educated man shall mean also to be a good man? Probably no one looks upon Plato's ideal Republic as the basis for any effort in practical politics. Nevertheless, it ought to be true that civic virtue should be a part of the life and of the environment of our seats of learning, and that men, along with the training of their minds, should grow into some sort of appreciation of their duties to the State, and come to know that courage and patriotism and devotion rank higher in this world's service than scholarly finish or brilliant intellectual power.

When we look back on our own history as a nation, we can but realize that in the crises of our national life this truth has been forced home to us. In the darkest hours of the Revolution it was the courage, the never-failing patience, the unselfish devotion,—in a word, the civic virtue,—of George Washington that was the real power upon which the people leaned. In the agony of our Civil War, when the fate of the nation trembled in the balance, the character of Abraham Lincoln—his devotion, his hopefulness, above all his knowledge of the plain people and his faith in them—counted more than all else in the decision. Neither of these men was the product of university training, nor did he grow up in an academic environment; but each had the training of a school where devotion to the State was the cardinal virtue. When next a great crisis comes, no doubt there will be a Washington or a Lincoln to meet it; but will he come from a university?

When Washington came toward the close of his life, he thought deeply over the dangers of the new State and

the necessity for the cultivation of a spirit of intelligent patriotism. As a best means for inculcating this spirit, he conceived the idea of a great National University. One of the main objects of this university was to afford to the youth of the country the opportunity for "acquiring knowledge in the principles of politics and good government." The idea was a splendid one; and while, in my judgment, the need for a national university no longer exists (unless, indeed, one is needed to teach the principles of good politics), Washington's idea that the university is a place which should train not only the intellect, but the character, that it is a place where the student should find an atmosphere adapted not only to the development of accurate thought, but also to a wise and tolerant spirit, that in the university he should gain not only intellectual strength, but also a just conception of his duty to the State, was a right view. And until this is recognized,—until we bring into our college life and into our college training such influences as will strengthen the character as well as the intellect, until the time shall come that the educated man shall by reason of his training be not only more able than his untrained neighbor, but also more patriotic, more courageous, better informed concerning the service of the State, and more ready to take up its service,—until such a spirit is a part of our system of higher education, that system will not have served the ends which education should serve in a free State and for a free people.

And in this connection I cannot refrain from a reference to the aim of those who founded the Institute of Technology, and to the conception of duty which they have impressed upon the institution. The recognition of the value of exact science as a means for the training of the mind came slowly. Even after it did come, men were slow

to recognize the value to the race of the results of science. The spiritual side of scientific research is a matter which even to this day men are slow to comprehend, notwithstanding the powerful effect which it has had during the last generation upon the thought and upon the conscience of the world. "Newton was a great man," writes Coleridge, "but you must excuse me if I think it would take many Newtons to make one Milton." That was the attitude of his age. Even forty years ago there were few men in this republic who appreciated in any clear way the value of science in the training of men. To William Barton Rogers, and to those who labored with him, belongs the credit of anticipating the value of this training and the demand for it. But, outside and beyond all these considerations of fitness and of practical results attained, they also impressed upon the institution certain principles which are dominant in its life to-day. One of these concerns itself with the very situation and environment of the Institute. The Institute of Technology has its roots in the same soil which supports the industrial life of the city and of the nation. Its contact with the practical side of life is immediate and real. It not only draws its strength thence, but expresses as only that can which has a real and vital connection the aspiration of those who labor in science for the upbuilding and the improvement of civilization. The Institute of Technology not only aims to serve the people: it is itself of the people.

One of the lessons which the study of exact science leaves with the student is the necessity not only for exact work, but for a high ideal. Science is satisfied with nothing short of perfection; and this principle, when it pervades a body of men, comes to govern and control the spirit in which their work is done. No better heritage can be left



to any institution than that which has been faithfully handed down to you: that in education it is not sufficient to be merely accurate; it is necessary to hold fast to the highest ideal. Once this ideal gains control of a student's life, that student will undertake faithfully and courageously whatever duties lie before him, whether they concern his professional life, his social life, or his country's service.

Let me add, in conclusion, a word of personal greeting, speaking as one may when he addresses those who have come together, drawn by a common interest.

In the name of the Corporation and of the Faculty and of the students of the Institute of Technology, I thank those who represent here other institutions for your presence on this occasion. Your coming is a source not only of pleasure, but of encouragement to us, and helps to emphasize that spirit of common interest and of common helpfulness which ought ever to mark the relations of those who have to do with education. The Institute of Technology extends to you, and through you to the institutions which you represent, the assurance of its cordial good feeling.

Two of those who sit upon this platform, the President of Lehigh University and the President of Harvard University, came from the Faculty of the Institute. This fact gives to your presence here an additional element of interest, and we extend to you a special greeting. To Lehigh University, in the sturdy work which she has done and is doing, for the courage with which she has not hesitated to face difficulties, we extend our warm congratulations. To our near neighbor, the oldest and greatest of American universities, we offer a most hearty greeting. We rejoice in the growth and in the strength of Harvard University, and take courage in the thought that we join hands



with her to-day — as an elder sister — in a work not only for this city and for this Commonwealth, but for humanity.

Gentlemen of the Corporation, in accepting the responsibility which you have this day invited me to share with you, I do so hopefully, and with full confidence in you, in this community, and in the future. There is no greater work committed to men's hands than that to which we are called. As I think of those who have preceded me in this place, and call to mind their splendid services to the Institute, to the Commonwealth, and to the country, I accept this work with a feeling of great humility, but with the earnest hope that through our common effort the institution may grow not only in strength, but in usefulness; not only in facilities for work, but in the better understanding of what work means; and that it may ever seek to lead in all that concerns the rational and helpful teaching of applied science.

Gentlemen of the Instructing Staff, for the cordial welcome to your number I am most grateful. I come to you with no new message and as the herald of no new gospel. The same spirit of work and of devotion which has been the glory of your body in the past must be our source of strength for the future. In all that leads to the uplifting of technical education, in the development and extension of the work of the institution, in the suggestion of new means by which it can minister more directly to the work of education upon the one side and to the promotion of scientific research upon the other, I ask your hearty co-operation and assistance. An institution, like an individual, if it is to minister to a growing civilization, must grow in its experience, in its appreciation of truth, in comprehension of the meaning of art and of science and of life. The inspiration which shall stand behind this growth must rest, in large measure, upon your zeal and your effort.

Alumni of the Institute, to each of you has been sent an invitation to this gathering. These missives have gone to every country and to every climate. Some are at this moment being borne on the backs of men or on snow sledges to the interior of Alaska, to be read months hence amid the winter snows. Some will be read in the tropics, under the glare of a summer sun. Your Alma Mater would gladly have welcomed each one of you this day to her fire-side, though the fare be frugal and the feast modest. Since this cannot be, let her invitation carry at least this suggestion. How far soever from her halls your path may lead, it can never take you beyond the circle of her affection. The Institute is proud of the men she has sent forth, and she counts upon their loyalty and their devotion. She invites your counsel, your suggestion, your friendly criticism, your help. And, while she listens with willing ear to every voice which rings true, she asks you to remember that no greeting so thrills her as that which comes up from one of her own children who is doing a man's work in the world.

Students of the Institute, in a more real sense than any other body, you are the Institute of Technology. As such, I salute you to-day, and assure you not only of my earnest wish for your advancement and your success, but also of my desire for your friendship and for your help. I prefer to think of such an institution as that in which we work together not as an empire governed by the few, but as a republic in which faculty and students alike are charged with the government of the whole body.

I congratulate you in taking up the study of engineering, using that term in the broadest sense. There was never a more opportune time to enter such work, nor was there ever a period in the history of our country when the trained engineer found open before him so attractive a field. This

is the day of the trained man, and to him the responsibilities and the rewards will go. To the American engineer a whole series of new problems of the highest interest has in recent years been presented. Railways are to be built, canals are to be cut, a whole empire of desert land is to blossom under his hand. The Pacific Ocean and the countries which border upon it are to be the theatre of an enormous development. Cables will be laid, cities will be developed, the tropics will be subdued. In all this development the trained engineer is to play a rôle that he has never yet played since civilization began. The next quarter-century is to belong pre-eminently to him, and in all these world-problems and world-enterprises you are to share. May I hope that in your preparation you may bear in mind as your ideal of an engineer, not only one who works in steel and brick and timber, but one who by the quality of his manliness works also in the hearts of men; one who is great enough to appreciate his duty to his profession, but likewise, and in a larger and deeper sense, his duty to a common country and to a common civilization.

## EDITORIALS

If "Waterloo was won on the playing-fields of Eton," then the inauguration ceremonies of October 24 were prepared for in the laboratories and lecture-rooms of the Institute of Technology. The dignity of aim, the simplicity of method, the thorough attention to detail (without obtrusion of details), which made the induction of President Pritchett an event so pleasant to the participants and so fortunate for the Institute, are qualities that Technology men, as undergraduates, absorb in their daily college life, and find to be among the best parts of their education. It was not through luck that the marshals and their aids were so prompt and courteous as to cause every one entering Symphony Hall to feel himself the particular guest of the occasion; it was through no accident that the thirteen hundred students, when the new President turned to address them, rose with a precision as swift and silent as that of a gigantic trip-hammer stayed in mid-air; it was through no lack of animal spirits that those same young men entered and left the hall in order and decency, knowing, as gentlemen, that the greatness of the occasion and respect for the Institute's guests called for a repression of youthful enthusiasm until, in the torchlight procession of the evening, it could find proper and rightful vent; and, finally, it was no mere chance that inspired all the speakers to dwell in their addresses on public service as the true end of education. All this was but the natural expression of that atmosphere and spirit which President Rogers and his associates infused into the Institute in the beginning, and which has marked the work of the college and of its students ever since.

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To those — alas, how small a proportion! — who had been fortunate enough to come under the inspiring influence of President Rogers the day and its observance seemed just as he would have had them. Even the atmosphere was sunny and genial, like himself. The distinguished guests whose presence graced the occasion, the

simplicity and yet dignity of the exercises, the breadth of thought in the addresses, the marked emphasis upon manliness, and, not least, the personal devotion to the Institute, shown in so many and such different ways, were the culmination, even as he foresaw it, of forces that he conceived and set in motion. Through all the growth in numbers and the consequent elaboration of detail, he would have clearly seen, unchanged, the enduring plan and principles which he laid down. So, to the older alumni at least, the formal ceremonies of inauguration took on the sacred character of a real consecration.

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The death of no man, outside of active political life, has called forth recently so much comment in the daily press as did that of Mr. John Sherman, and this in the excitement of a political campaign. There is every reason why his countrymen should be interested in his career. Longer than any other man of his time he has held high office, as member of the House of Representatives, as Senator of the United States, as Secretary of the Treasury, and as Secretary of State. In at least two of these positions, he showed marked ability; and the press of the country has united in giving him full credit for honesty, intelligence, and energy in the public service. There is every reason to believe that no more honest and few abler men than he have entered public life. Nevertheless, he failed to reach the goal of his ambitions; and much of the newspaper comment concerning him since his death has been given to explanations as to why he never became the candidate of his party for the Presidency.

Mr. Sherman left behind a paper which has appeared in the *post-mortem* literature concerning him, and which throws a curious light upon this question. This paper is his last will and testament, written ten years ago. In this document he bequeaths property valued at sums ranging from two to three millions of dollars. The beneficiaries are near relatives and an adopted daughter, no children having been born to him. There are but three small bequests to public purposes. The limitations of character and training which made such a disposition of his property possible are exactly

the limitations which prevented him from becoming President of the United States.

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Any man who could pass so long a life in public service with such unusual opportunities to know public needs, and the directions in which a wise philanthropy could serve great public ends, and who could during this period accumulate a fortune of two and a half millions of dollars, and yet have so few ties of sympathy and of interest with the mass of his fellow-countrymen that no plan for their improvement or assistance appealed to him in a generous way, must necessarily have had but slender ties of personal influence, and have aroused amongst his colleagues but little personal loyalty. And so it happened that, when he was the logical candidate for President, by reason of ability and of long service and high place well filled, he failed because he was not able to lay his hands upon the cords of common sympathy which move men. How narrow his interests were, and how contracted his sympathies, his last will and testament show more clearly than any outside study of his life could possibly reveal. To become President of the United States, it is not necessary that a man should possess what is popularly called magnetism; but it may be set down as certain that no man can be President of the United States of America who does not have an intelligent sympathy with and an intelligent interest in the social and moral forces that look toward progress, and no man could have this sympathy and this interest and yet be the author of Mr. Sherman's will. Mr. Sherman failed of the Presidency by reason of his own limitations.

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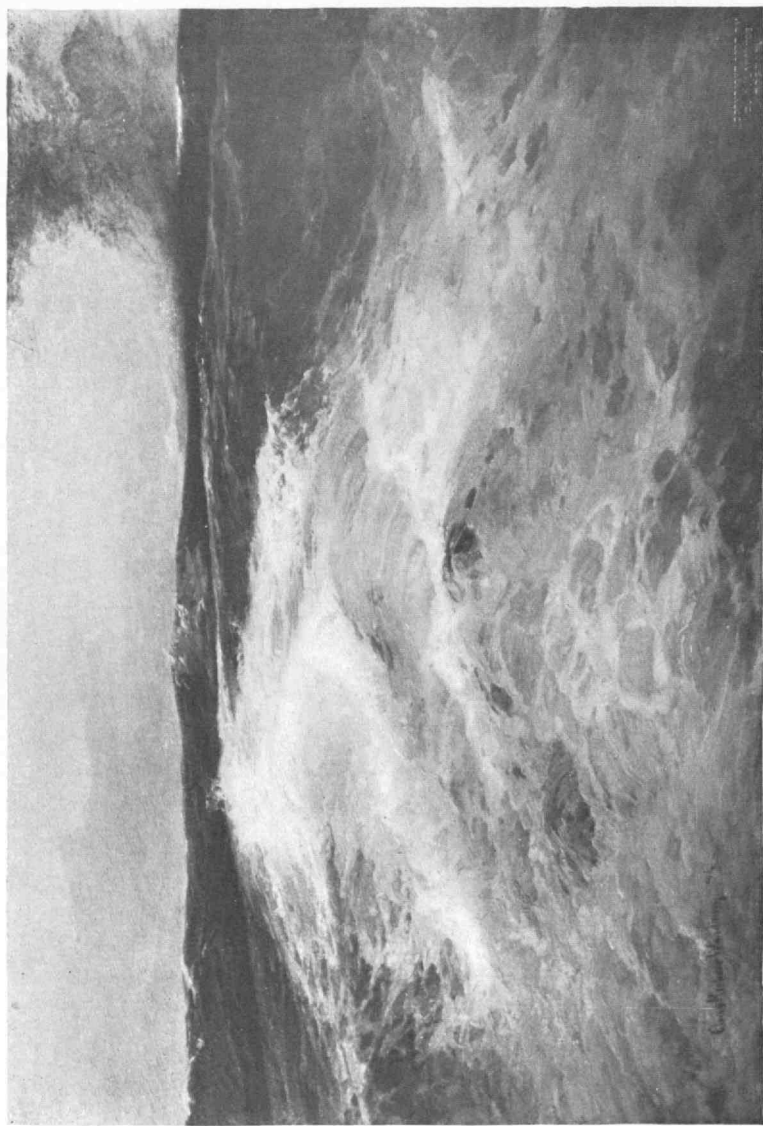
This lesson — and it is directly in line with President Pritchett's address at his inauguration — teaches that the thing most fatal to man, whether from a material or a moral point of view, is narrowness of interests. It may or may not be a crime — as Mr. Carnegie says it is — for a man to die with his riches stored in a safety vault. But it is unquestionably a crime for a man to come to the end of life with all his thoughts, all his endeavors, all his accumu-

lated store of wisdom and experience bottled up within himself, centred upon himself, and used only to promote his own immediate interests. Legally, of course, a man has a right to do what he will with his own. Morally, however,—and for the sufficient reason that he is always enormously in debt to society, past and present,—he has no right to withhold from as large a circle of mankind as he can reach a major share of his mental and moral fortune. It may give him more time for business, and it is certainly much easier for a capitalist in the greatest city of America to draw checks in favor of this and that band of political banditti in order that his business may be let alone; but, unfortunately, by drawing checks to the order of the devil, one becomes a joint stock proprietor in Hades, and sooner or later an assessment is levied upon every shareholder's soul or upon those of his friends and relations.

Similarly, it is far easier for the professional man—who, fortunately for him, is usually very busy—to bury his nose deep in the sand of his profession, and to imagine that his fellow-citizens have forgotten his existence, and have ceased to wonder why he does not do his fair share in carrying on the government and in promoting the social order. But his fellow-citizens do not lose sight of him, though they may lose sight of his professional achievements behind a little cloud of contempt for his social shirking. Neither is he forgotten in Hades, whose proprietor is sure of success so long as educated men, who ought to do their fair share toward caging him, are content to shut themselves up in the little cages of their own concerns.

It would not be amiss, therefore, to place over the door of every Institute lecture-room and laboratory, in letters as big as the golden ones that distinguish the "President" from the "Secretary" in Rogers Building, the phrase, BE BROAD. And some day, perhaps, after a system of keeping track of the physical condition of the students shall be perfected and in working order, the psychical laboratories, out of the chaos of their formidably named machines, may develop an instrument for determining how much a young man's education is broadening his mind and increasing the range of his interests. With such instruments it will at last be possible to





“Mid-Ocean,” by Charles Herbert Woodbury, '86.

From a copyrighted photograph by C. A. Lawrence, Boston.



settle, graphically, the much-vexed "culture" question. And it would be quite safe to predict as the result of such measurements a proof that real culture comes not from the subjects taught, but from the way the teachers teach and the learners learn.

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## EXAMPLES OF NOTABLE WORKS BY INSTITUTE MEN

"MID-OCEAN," BY CHARLES HERBERT WOODBURY

Although emphasis is placed at the Institute upon the useful rather than upon the fine arts, a number of Technology men have distinguished themselves as painters and sculptors. Prominent among these is Charles Herbert Woodbury, of the class of '86, one of whose paintings is reproduced herewith.

Born in Lynn, Mass., July 14, 1864, Woodbury began to paint at the age of fourteen, exhibiting for the first time at the age of seventeen. Nevertheless, having come of a race of engineers, he decided to become an engineer himself, and entered the Institute of Technology in 1882, graduating therefrom with an excellent record in 1886.

While carrying on the work of the college, Woodbury found time to study and work at the art for which he had already shown so much talent, exhibiting from time to time, and having one of his pictures chosen for purchase by the Boston Art Club in his Junior year. After graduation he took a studio in Boston, in the following year held a successful exhibition, was married in 1890 to Miss Marcia Oakes, herself an artist, and spent the greater part of the following six years studying in Europe. He is now established at the Harcourt Studios.

He is a member of the Society of American Artists, is president of the Boston Water Color Club, and was a member of the National Jury for the Paris Exposition of 1900.

Among Mr. Woodbury's early pictures, painted while he was

still a student, is the "Lynn Marshes," which, by his courtesy and generosity, hangs in the Common Room of the Technology Club. Among the more notable of his later paintings are the "Ground Swell," bought by Mr. Andrew Carnegie; "The Green Mill," (medal, Paris, 1900); "Heavy Sea," owned by Mrs. Charles J. Paine; "On a Lee Shore," "A Rock and the Sea," "Maine Coast," etc., most of his pictures being marines, although he started as a landscape painter.

The "Mid-Ocean," produced herewith, was painted in Holland in 1894 from studies made on the Atlantic. It was exhibited first in the Salon at Paris, and afterward in all the principal exhibitions in this country. It received a prize of \$400 at the Nashville Exposition, and was purchased by the Berkshire Athenæum for \$2,500.

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## GENERAL INSTITUTE NEWS

### CORPORATION NOTES

The two hundred and eighty-fourth meeting of the Corporation was held at the Institute October 10, 1900, President Pritchett assuming the chair for the first time. Memorials were presented of Mr. Augustus Lowell, by Colonel Livermore, and of Mr. John E. Hudson, by Mr. Blake, as follows:—

Whereas, John Elbridge Hudson, Esquire, a member of the Corporation of the Massachusetts Institute of Technology, died October 1, 1900, be it

*Resolved*, That the Corporation hereby record their grateful appreciation of the active interest in the welfare of the Institute displayed by Mr. Hudson during his brief service as a member of this Board, and of the benefits by him conferred upon the Institute during the many years of his service as president of the American Bell Telephone Company, when he was ever ready to act most liberally in accordance with his belief that a Corporation engaged in the application of the results of scientific research to commercial use is under a perpetual obligation to promote the growth of technical schools.

*Resolved*, That the Secretary be, and he is hereby, requested to enter these resolutions upon the records of the Corporation, and to send a copy thereof to the widow of Mr. Hudson.

Mr. A. Lawrence Lowell was elected to succeed his father as member of the Executive Committee for five years; and Dr. Williams was re-elected Secretary. The usual committees were appointed, President Pritchett succeeding ex-President Crafts as trustee of the Museum of Fine Arts, Mr. Lothrop and Dr. Williams replacing Mr. Augustus Lowell and Mr. Stockton on the Committee on Nominations. Appointments of the Executive Committee were confirmed, as elsewhere reported; and the degree of Bachelor of Science was conferred on Miss Clara Isabel Durgin, Mr. Philip Roland French, Miss Alice Virginia Wilson of the class of 1900, all in the department of Chemistry.

A special meeting to authorize the sale of land was held at the Institute November 6.

The two hundred and eighty-sixth meeting of the Corporation was held at the Institute on December 12, the principal business being, as usual at the December meeting, the presentation of the reports of the President and Treasurer. Appointments by the Executive Committee were confirmed; and the degree of Bachelor of Science was awarded to Joseph Simonds Crosswell in Mechanical Engineering, John Heber Larrabee in Civil Engineering, and Burt Ransom Rickards in Chemistry.

The following memorial of the late Mr. Thomas Gaffield was presented:—

Our colleague, Mr. Thomas Gaffield, died Thursday, December 6, 1900, at his home on Allen Street, at an advanced age. Mr. Gaffield became a member of the Corporation in March, 1896, having been for many years before an actively interested member of the Society of Arts. Since his election to the Corporation he has served continuously as a member of the visiting committee on the departments of Chemistry and Biology, and the former department has received many evidences of his warm interest.

Mr. Gaffield presented to the department his specimens of glass representing the results of his study of the prolonged action of light upon glasses of varying composition. With these was a specimen showing oddities of various sorts in glass manufacture, as well as samples of materials and specimen tools used in a glass-house. He also presented to the Chemical Library a considerable number of books bearing upon chemical industries.

For two years or more Mr. Gaffield lectured to students of the third year of the Chemical Course on glass manufacture. His lectures were especially valua-

ble for his good advice to the young men. His disposition toward the department, as evidenced at the time of his gifts, particularly in his attitude toward those from the department who came into contact with him, was most kindly and in complete accord with the traits for which he was so widely respected. It was plainly to be seen that, in parting with his glass specimens, the minerals given to the Department of Geology, and his books, he was complying with the dictates of his generous nature, at a sacrifice of his own feelings on the other side; for it was evident that, in giving them into the custody of others, he was breaking ties of association which meant much to him. There was a pathos in the earnestness with which he asked for assurance that he should have ready access to them himself for the sake of these old associations. He visited the department somewhat infrequently in late years on account of feebleness.

*Resolved,* That this memorial be made a part of our records, and that a copy be sent to his family.

President Pritchett's report, copies of which will be sent in due time to subscribers of the REVIEW, refers to the death of three members of the Corporation,—Mr. Lowell, Mr. Hudson, and Mr. Gaffield; to the changes and developments in the work of the school in various directions, with the usual statistics of instructors, students, scholarships, etc. Extended reports from the professional departments are also included. The greatest prominence is, however, given to the imperative need of establishing at the Institute a department of physical culture in connection with the Walker Memorial, for which subscriptions have been made by the alumni of the Institute. The interest of this subject to readers of the REVIEW is such that, with the President's permission, this portion of his report is here given in full:—

“The completion of the Pierce Building practically exhausted the land at present available for building purposes, that on Garrison Street being too remote. On the other hand, the removal of the tracks of the Boston & Providence Railroad offered an unequalled opportunity for securing additional land contiguous to our own. After prolonged negotiations the Executive Committee, with the approval of the Corporation, secured a tract of fifty-one thousand square feet, completing the rectangle bounded by Clarendon and Stanhope Streets, Trinity Place, and the passageway along the present Engineering Building ‘A.’ This purchase has immediate

relation to a matter to which I now call your attention, the solution of which I consider of immediate importance.

Most of those interested in a thoughtful way in the educational institutions of the United States feel that the question of physical culture is one which as yet has not been successfully dealt with in our colleges and technical schools. The present attitude of most institutions of learning toward the instruction of their students in the care of health is either one of absolute neglect or else one which fosters to an undue degree certain athletic games. In the first case, the result is that few students receive any sensible instruction as to exercise, diet, and the proper care of their bodies; while, in the second case, a few students are encouraged, often at the expense of scholarship and health, to a system of severe training that is out of all proportion to normal life.

In the Institute of Technology a small gymnasium is maintained, and an instructor in gymnastics provided for those who care to avail themselves of his services. Military instruction occupying three hours a week is given to the Freshman Class, and one lecture on the care of the body. Up to this time, however, we have not undertaken to conduct a department of physical culture or to supervise in any way the athletic contests into which our students enter.

It is a singular thing that, while the development of modern science has been used with such success in all that pertains to the intellectual side of our development, we have been slow to avail ourselves in the same way of that knowledge which helps to prevent disease and to conserve health. The time has come when it seems to me not only of vital importance, but of absolute necessity to provide a system of rational instruction in the care of the body which shall conserve the health of our students. To quote from one who is not likely to give undue weight to the matter of physical training, 'Since vigorous health and its accompanying high spirits are larger elements of happiness than any other things whatever, the teaching how to maintain them is a teaching that yields in moment to no other whatever.' At present we are not giving such instruction, nor are we providing our students with a rational system of physical culture. I have, therefore, to recommend that we inaugu-

rate at the earliest possible moment a department of physical culture, organized along the following lines : —

At the head a man familiar with student life, a trained physician, who shall spend his whole time in the care and the supervision of the department.

As a centre of the life for this department, we must have at an early date the Walker Memorial Building, which should be not a gymnasium in the narrow sense, but a building for physical culture and direction, in which, under the direction of the head of the department, students may be introduced by the laboratory method to a knowledge of the proper laws of health. A system of physical culture could be begun, which for the first-year students would be compulsory. The main features of this course would be, in addition to such lectures as the head of the department might give, the following : —

(1) Each man entering the first-year class should have a strict physical examination, and should receive, in accordance therewith, directions from the head of the department as to exercise, diet, and the proper method of preserving health. A careful record of these examinations and of subsequent examinations would of themselves form a most valuable series of observations.

(2) Under the direction of the head of the department, each student so examined should spend a prescribed time daily in good weather in open-air exercise. That such exercises or sports shall be adapted to the need of the individual, so that, for example, the student who is inclined to be flat-chested, or who is inclined to pulmonary disease, may be directed to one thing, and one who suffers from an excess of fat may be sent to another. An athletic field would be a convenient but not necessary part of this system.

(3) At times, when the weather does not permit, similar exercise should be taken in a well-lighted and well-ventilated room.

(4) That competitive sports of such a kind only shall be encouraged as may secure outdoor exercise, and particularly those which enable the individual to compete, such as track athletics, rather than those which depend on expensive and time-consuming team work, and that, in general, athletic exercises shall be con-

ducted in a way not only consistent with, but subordinate to good scholarship.

The alumni began two years ago subscriptions for the erection of such a building as a memorial to General Walker. Considerable progress has already been made on these subscriptions, and a little more than one-third of the amount desired has been pledged. With a definite statement from the Corporation as to what may be available for a site for this building, together with a guarantee to furnish a man of proper qualities to direct such a department, I feel sure that the remainder of the fund will be subscribed promptly. I have therefore to urge most strongly that the alumni of the Institute be informed that, in case the sum of \$100,000 is subscribed for before July 1, 1901, the Corporation will set aside fifteen thousand square feet from the land recently purchased in Trinity Place for a site, and that it will provide a director of a department of physical culture. There is no other need at this moment which in my mind is so pressing, and it seems to me absolutely necessary to dispose of this question before taking up others which will be soon demanding solution.

I feel that this matter is of such importance that any other recommendation which I might make to you at this time would be secondary to it. I have therefore asked the Executive Committee to consider this matter at an early date, with a view to immediate action.”\*

In answer to an application from the superintendent of schools in Porto Rico for the admission of students from that island, it has been voted that the President be authorized to assure free tuition for two students, if their preparation should be found entirely satisfactory. As yet no applicants have been presented.

An invitation has been accepted for an Institute exhibit at the Pan-American Exposition in Buffalo next summer.

Payments have been made by the executors of the late Robert C. Billings amounting to \$142,500. The income of fifty thousand dollars is to be applied, under the terms of Mr. Billings's will, to the aid of students, who will be “expected to abstain from the use of alcohol and tobacco in all their varied forms.”

\* See page 101 for statement of action.



## FACULTY AND INSTRUCTING STAFF

Captain William Baird succeeds Lieutenant James Hamilton as Professor of Military Science and Tactics. Captain Baird comes to the Institute with a long and honorable record of varied service, terminated by his retirement for ill-health. He has taken up the exceptionally difficult and important work assigned him with intelligence, tact, and success.

Mr. Homer Albers, LL.B., has been appointed lecturer in Business Law, succeeding Mr. Joseph Willard.

Messrs. Charles William Berry, William David Coolidge, William Thomas Hall, George Leonard Hosmer, Joseph Cains Riley, and Alpheus Grant Woodman, Assistants of last year, have been promoted to the rank of Instructors.

The following instructors and assistants of last year have terminated their connection with the Institute, to engage in professional practice or for advanced studies elsewhere: E. M. Bragg, W. B. Russell, and E. W. Rutherford, in Mechanical Engineering; A. A. Blanchard, L. P. Chapin, M. S. Sherrill, L. J. Seidensticker, and W. H. Walker, in Chemistry; M. L. Fuller, in Geology; F. H. Watts, in Civil Engineering; J. G. Coffin, in Physics; A. L. Davis, F. L. H. Kimball, and E. Walker, in Mining Engineering.

Dr. Charles Hyde Warren, of Yale University, has been appointed instructor in Geology, in place of Mr. Fuller; Mr. Walter Swift Leland, of the class of 1896, becomes instructor in Naval Architecture during the time of Mr. Clark's leave of absence.

The following assistants have been appointed: Reuben Wilfred Balcom, John Wesley Brown, and James Henry Walton, in Chemistry; Edward Everett Bugbee, Howard Clark Plummer, and William Leonard Stevens, in Mining Engineering; Charles Mussey Fosdick and Arthur Burr White, in Civil Engineering; Cyrus Howard Haggood, in Physics; Albert Sydney Merrill, Timothy Cyril O'Hearn, and Lawrence Southwick Smith, in Mechanical Engineering; Carleton Ellis, in Oil and Gas Analysis.

Teachers and lecturers for the current year: Homer Albers, LL.B., Business Law; John Alden, S.B., Textile Printing; Philip



Alger, U.S.N., Naval Architecture; Truman H. Bartlett, Modeling; Louis Bell, Ph.D., the Electrical Transmission of Power; George W. Blodgett, S.B., the Application of Electricity to Railway Signalling; John Balch Blood, S.B., the Design of Alternating Current Machinery; Gary N. Calkins, Ph.D., Protozoa inhabiting Water Supplies; Henry Carmichael, Ph.D., Electrolysis of Brine; S. Everett Doane, Incandescent Lamps; George W. Field, Ph.D., Applied Zoölogy; Howard C. Forbes, S.B., Commercial Electrical Testing; John R. Freeman, S.B., Fireproof Construction and the Hydraulics of Fire Protection; Hollis French, S.B., Electrical Engineering Practice and Specifications; Charles M. Green, Electric Arc Lighting; David A. Gregg, Pen and Ink Drawing; Hammond V. Hayes, Ph.D., Telephone Engineering; John George Jack, Horticulture; Charles D. Jenkins, S.B., Illuminating Gas and Pottery; Edwin O. Jordan, Ph.D., Bacteriological Measurements of the Self-purification of Water; Simeon C. Keith, Jr., S.B., Bacteriology of Milk Products; Walter H. Kilham, S.B., History of Ornament; Ernest A. Le Sueur, S.B., Industrial Electrochemistry; Arthur D. Little, Paper; James W. Loveland, S.B., Manufacture of Soaps; Guy Lowell, A.B., S.B., graduate École des Beaux-Arts, Landscape Gardening; Samuel W. Mead, Architectural Design; Frederick H. Newell, S.B., Hydrography; Walter E. Piper, S.B., Rubber; Odin B. Roberts, LL.B., the Nature and Function of Patents for Inventions; A. H. Sabin, M.S., Paints and Varnishes; Albert Sauveur, S.B., Metallography; Timothy W. Sprague, S.B., Electricity in Mining; John Stone Stone, the Application of Electrical Oscillations in Telephony; R. Clipston Sturgis, A.B., English Architecture in Connection with Landscape Gardening; Elihu Thomson, Recent Developments in Applied Electricity; Ross Turner, Water Color; W. Lyman Underwood, Bacteriology in the Canning Industries; George C. Whipple, S.B., the Microscopical Examination of Drinking Water; Jasper Whiting, S.B., Cement Manufacture; S. W. Wilder, Jr., S.B., Alumina and Alumina Compounds; C. J. H. Woodbury, A.M., Electricity in its Relation to Fire Risks.

Of the teachers and lecturers for the year, Captain F. M.

Green, Colonel H. G. Prout, Mr. Theodore H. Skinner, Mr. George W. Tillson, and Mr. Albert L. Webster retire.

#### FELLOWSHIPS

Mr. Gorham P. Stevens of the class of 1898 retains the Swett Fellowship, and is continuing his studies in Paris. His admission to the École des Beaux-Arts as twenty-third out of sixty candidates shows the high quality of his work.

The Savage Fellowship has been awarded to Mr. Paul L. Price of the class of 1900, who is continuing his architectural studies at the Institute.

#### STATISTICS

A review of the usual statistics of the President's report draws attention to certain points of interest. The total number of students, which has remained nearly constant for seven years, is now increased by 99, the increase being about equally divided between the first year and special students. The increase in the fourth year is offset by the nearly equal falling off in the third. The comparison by courses shows gains in Mechanical, Mining, and Chemical Engineering, losses in Civil Engineering and Chemistry. This classification does not, however, include either first year students or specials. The number of five year students is the same as last year, thirty-five. The number of students registered for mathematical subjects reaches the unprecedented total of 844, while physics with 793 is a good second. All the States and Territories represented last year are still included, with the addition of Arkansas and the Hawaiian Islands. Bermuda replaces Dutch Guiana among the foreign countries. Of the total increase of 99, fifty-three come from Massachusetts, the State's representation declining by one per cent. The number of Massachusetts towns and cities represented is increased, however, by from 111 to 135. Ninety-nine college graduates are registered against eighty-one last year, seven holding the Institute degree, twenty-three that of Harvard, five of Brown, three of Amherst. The number of women students has declined from fifty-three to forty-five. 312 applicants have en-

tered on entrance examinations, 176, a notably large proportion, on certificates of previous college work, or to higher standing on examination, or without examinations by reason of age, previous experience, etc.

The table of graduates now shows a total of 2,314, without change in the relative numerical order of departments, except that Naval Architecture with forty-three graduates has now overtaken Natural History-Biology with thirty-nine.

#### NEW RULES

In view of the extent to which students have come to delay making up their deficiencies, the following rule has been adopted by the Faculty:—

All marks of D are required to be removed at a date to be determined by the respective instructors, but not later than eight weeks after the beginning of the next school year following the imposition of such marks. In case a mark of D is not removed at the date thus determined, the student shall be required to drop any dependent subjects and cease to be regarded as a regular student.

All failures and other deficiencies remaining in the case of fourth year students who seek to become eligible for the degree are required to be made up at a date not later than the beginning of the second term of the fourth year except in the case of those which have been incurred during the first term of the fourth year and in subjects which from the character and arrangement of the work can be pursued only in the second term.

Another change of rule is designed to secure better enforcement of the elective entrance requirement introduced two years since:—

Any candidate who has not previously presented a satisfactory elective shall be required at entrance to designate the subject in which he shall pass off the requirement. Such work shall be done during the first term of the first year, shall be outside of regular studies, and shall involve a final examination; but any student may be excused on the ground of excellence of regular work in the same subject. If the elective is not made up at the end of the first term, the deficiency shall have the same effect as a D in any other subject not made up at the proper time.

A slight change in Course VI. introduces a course on the Propagation of Electric Waves, by Professor Clifford, alternative with

Mr. Blodgett's course on Railroad Signals; and in Course IX. third year students have the opportunity to substitute Industrial Electricity in place of Heat.

#### NEW ENGLAND ASSOCIATION OF COLLEGES AND PREPARATORY SCHOOLS

By invitation of the officers of the Institute the annual meeting of the New England Association of Colleges and Preparatory Schools was held at the Institute October 13 and 14. President Eliot of Harvard University presided; and the programme included addresses by President Hadley of Yale, President Faunce of Brown, Professor McDonald of Bowdoin, and others, on educational questions of general interest. An evening reception afforded welcome opportunities for better acquaintance between members of the Institute Faculty and of the Association, and the general success of the meetings, as a whole, was highly appreciated.

#### PARIS EXPOSITION

As stated in the last report, the Institute was requested by the officials of the United States Commission for the Paris Exposition to be one of two institutions for exhibiting higher education in engineering and architecture in the United States. The Executive Committee authorized the necessary expenditure, and a committee of the Faculty carried out the preparation of the exhibit.

The amount of space allotted to the Institute was at first so limited that an effective exhibit was deemed out of the question; but by the courtesy of Director Rogers a special assignment of hanging space on an important façade was made, which permitted an effective display of large architectural designs. The remainder of the exhibit consisted chiefly of photographs of a standard size, exhibited in winged frames, and of portfolios with text and photographs illustrating the work of our Engineering Departments. Liberal use was made of the various Institute publications, and effective aid was rendered by Institute graduates connected with the Massachusetts Commission or resident in Paris.

Besides this main exhibit, special collections of minerals and other building stones were made through our Department of Geology, the material being collected from all parts of the country by Professor Crosby and Mr. Fuller, and coming into the possession of the Institute at the close of the Exposition. The Institute shared through the Department of Economics in the preparation of the exhibit of the Massachusetts State Board of Health.

During the summer several members of the Faculty visited the Exposition, and brought back pleasant reports of the success of our share in it.

#### HONORS AT PARIS

Official notification has been received of the award of a grand prize for the Institute exhibits in class six, group one, Special Industrial and Commercial Education; of a gold medal in class three, group one, Higher Education; of a gold medal in class four, group one, Special Education in Fine Arts, Buildings, plans and models, arrangements, fittings; also of a silver medal for the exhibit in class sixty-three, Systematic Collection, ornamental stones, hard stones or building stones, rough hewn, sawed, or polished. The Exposition having closed, a portion of the Institute material has been donated, on request, to the Musée Pédagogique. The remainder is expected to be returned, and will be of use in connection with the exhibit at Buffalo. The register of visitors at the exhibit was, unfortunately, appropriated by one of them.

The Institute has learned by cable that the Department of Beaux-Arts and Education of the French government desires to own and place in the École des Beaux-Arts a number of the large framed drawings exhibited at the World's Fair in Paris by its Department of Architecture.

This is a great distinction, and a tribute to the value of the work of the oldest School of Architecture in the United States.

The Exposition authorities may be supposed to have given an excessive number of medals with the generous desire of acknowledging those who had aided them in their success, but it is an

entirely different matter when the State makes its choice of works for its museums of education. The French government has little desire to further cumber their museums and collections, for even their storerooms are full of distinguished works. It may be well said *a priori* that, when it selects anything at the present day, the object must have a decided value.

The competent special committee appointed by the Minister of Beaux-Arts and Education, and charged to make a choice of the best things of the Exposition, have in this case recognized officially the quality of work and the spirit of the method followed at the Institute. In asking for these drawings, it has paid the highest honor ever rendered to a foreign institution and one of which the friends of Technology have just right to be proud.

#### CANE RUSH

Readers of the REVIEW will have learned from the newspapers of the tragic ending of the cane rush between the first and second years students on November 14. Departing somewhat from the custom of previous years, the President had arranged for the general suspension of the exercises, and took pains to be present at the games. The story of the death of Hugh Moore need not be here repeated, but the presence of President Pritchett and his prompt assumption of responsibility for all later steps that could be taken were most fortunate. No more impressive meeting of Institute students has ever been held than that addressed so fittingly by him on the following day in Huntington Hall; nor has a more pathetic tribute ever been given to a student than by the classmates of young Moore, who followed his body silently past the Institute buildings to the railroad station, and who stood with bared head while the train bore it into the darkness, toward its final resting-place. The President's statement through the newspapers a few days later is so important in its bearings upon the policy of the school as to be repeated in full:—

“As I remarked in my brief talk to the students on Friday, when they assembled in Huntington Hall to arrange for the funeral of their dead comrade, that

occasion was not a fitting one to discuss the cause of his death nor the measures to be adopted in the future to prevent such fatalities. Moreover, the result of the autopsy, which showed the exact nature of the accident, was not then known. Sufficient time has now elapsed to enable us to bring together the facts and to take a calm view of them. It seems, therefore, fitting that some statement should be made on the part of the Institute of Technology, setting forth exactly what took place and indicating the purposes of the officers of the Institute in regard to such matters.

In most American colleges some trial of strength between the Sophomore and Freshmen classes forms a feature of the college life. In the Institute of Technology this class contest has for a number of years taken the form of a football match between teams chosen from the two classes, followed by a cane rush. The event takes place usually just before Thanksgiving, and occupies practically the whole of one afternoon. The contest has been distinctly a student institution (controlled by the upper classmen), and has not been recognized by the Faculty of the Institute. No official recognition was given to it this year; but the heads of the various departments informed students that, while the laboratories would be open to all who desired to work, the exercises would be so arranged as to excuse those who wished to attend the Sophomore-Freshman contest. This semi-official action was taken at my request, and for it I am alone responsible.

I was present during the last half of the football game and during the cane rush. It is my desire to be associated with the students of the Institute, not only in their work, but in their games and in their student life.

Furthermore, speaking for myself alone, I am free to say that, in my judgment, those in charge of institutions of learning cannot divest themselves of responsibility for the existence and perpetuation of such events as an annual cane rush; nor do I believe that such responsibility can be met by ignoring the existence of such customs, however they may be sanctioned by tradition.

The cane rush of November 14 was the first I had ever seen. It was carried out in the following manner:—

The cane, which is a strong oak stick about four feet long, with a knob at each end, was placed in the custody of the Freshmen. Six or eight of the strongest men in the class grasped it firmly. Around these a small circle of the most athletic Freshmen was formed, with hands clasped and facing outward. Concentric circles of Freshmen were added, until perhaps one hundred and fifty had been formed into a compact circular mass. Outside of this guard, formed to defend the cane, forty or fifty Freshmen operated in detached wings to interfere with the Sophomores in their attack.

These latter formed at the other end of the grounds in two flying wedges, which simultaneously flung themselves upon the mass of Freshmen, in the effort to break up their formation and reach the cane. After the first three minutes,



all that one could distinguish was one mass of struggling students. At the end of fifteen minutes a pistol-shot gave the signal for a cessation of the struggle. The number of hands on the cane was counted, and the class to which the larger number belonged was declared winner. Young Moore was an unusually strong fellow. For this reason, and on account of his interest in the cane rush, he was chosen as one of those to hold the cane. At some time during the struggle he was caught in such a way as to receive a powerful wrench, which, as the autopsy showed, dislocated his neck. His death was probably instantaneous. These, so far as I have been able to learn them, are the facts.

There are two objections to the cane rush, as thus carried out, either one of which is sufficient to banish it from college sports. It is not a game of skill, and cannot be played under definite rules; although upper classmen are supposed to quell fights. Under these conditions the intimate personal contact of the struggle has a strong tendency to lead up to rough play, without the restraining influence of football.

The second objection is all too evident in view of the sad event of last Thursday. Previous to this there have been, so far as I can learn, no serious accidents in these rushes. When the custom began, the classes were smaller and the danger of injury inappreciable. The danger increases with the increase of numbers and of the momentum of the two opposing forces. When four hundred or five hundred engage in it, the danger of injury is great. For this reason, if for no other, the time has come when the cane rush must be given up.

The reason for its adoption originally can be readily understood from the standpoint of the student. It forms the easiest and quickest means for a trial of strength. Into it all can enter. In addition, it is planned to give the Freshmen, who are new and unorganized, the advantage of being on the defensive. The casualties which have occurred have not come to the weaker students, but to the stronger and more athletic ones, who took the brunt of the battle.

As to what shall take the place of the cane rush in the Sophomore-Freshman contest, I am not prepared at this moment to speak with definiteness. This problem has been referred for the present to the Institute Committee. This, to-day, is a representative committee of students, chosen by ballot from the four classes. They will consult with an Advisory Committee of Alumni, and the plan which may be in this way suggested will be finally discussed by a committee of the Faculty. In no institution in the world is there a body of students more earnest, or having a keener spirit of work, than those in the Institute of Technology. They may be trusted to solve this question in good time and in the right way.

Plans have been for some time under consideration in the Institute for the establishment of a system of physical culture which should assist in the up-building of the health of the general body of students rather than in the development of expensive and time-consuming athletic contests, and which may help a



student of serious purpose to decide what athletic contests he may enter without injury to health or to scholarship. These plans will be pushed to completion as rapidly as the resources of the Institute will admit."

One of the first year themes which Mr. Moore wrote in the early part of the term was read by Dr. Pritchett, when he met the students in Huntington Hall the day after the cane rush. We print herewith a copy of another theme which was written by Mr. Moore, which shows his earnestness as a student, and which makes his untimely death seem all the more sad:—

#### MY FIRST IMPRESSIONS OF LIFE AT TECHNOLOGY

My first impression of life at Technology was in the chemistry recitation-room, where I was assigned to a seat and immediately asked a question on the metric system. This was entirely different from the arrangement of affairs that I had expected to have or had ever had before. I was impressed by the order which ruled everywhere. The Freshmen seemed to know where their recitations were to be held and how to get to the recitation-rooms. The new men, or rather those in our section, seemed to know just where to go and what to do almost as soon as the upper classmen. To sum it all up, every minute of time from the start as a Freshman to the finish as Senior is put to some practical value.

My second impression, was the impression made upon me by the President's speech. It seemed to bring the President nearer to me. It made me feel more at home in Tech. and in Boston, because I felt as though there was at least one person there who hoped I would stay in Tech. and was willing to help me over hard places.

My third impression was of the cordiality of the students toward one another and the seeming welcome of the old students to the new. If I asked an old student where my mechanical drawing room was, he would stop and tell me where it was and the quickest way to get to it as though all he had to do was to answer questions and help the new men over their difficulties.

Last, but not least of my impressions of life at Tech. was the Young Men's Christian Association reception to President Pritchett and the Freshman Class. This reception made me much at home at Tech. I was introduced to a number of my classmates at the reception, which went a long ways toward making my start at Tech. an enjoyable one.

To sum up my impressions of life at Technology, I may say that I was greatly surprised at the cordiality of the fellows, pleased with the President, and think a great deal of the work done here by the Young Men's Christian Association.

HUGH C. MOORE.

## THE UNDERGRADUATES

## THE GLEE, BANJO, AND MANDOLIN CLUBS

The annual winter concert was held before a very large audience in Huntington Hall on Tuesday evening, December 11. The programme was as follows:—

## PROGRAMME

- |   |                                    |
|---|------------------------------------|
| 1. Ho ! Jolly Jenkins . . . . .           | <i>Sullivan</i>                    |
| GLEE CLUB                                 |                                    |
| 2. March, The Viceroy . . . . .           | <i>Herbert</i>                     |
| BANJO CLUB                                |                                    |
| 3. Mirror Dance . . . . .                 | <i>Sniffin</i>                     |
| MANDOLIN CLUB                             |                                    |
| 4. The Silver Moon-baby . . . . .         | <i>Stone</i>                       |
| GLEE CLUB                                 |                                    |
| 5. Operatic Potpourri . . . . .           | <i>Arr. by Lansing</i>             |
| BANJO CLUB                                |                                    |
| 6. The Massachusetts Volunteers . . . . . | <i>Metcalf</i>                     |
| 7. The Dixie Kid . . . . .                | <i>Geibel</i>                      |
| GLEE CLUB                                 |                                    |
| 8. Aunt Matilda's Suitors . . . . .       | <i>Page</i>                        |
| <i>Characters</i>                         |                                    |
| Mr. GRIMES . . . . .                      | Gruff Bachelor                     |
| Mr. PERCIVAL . . . . .                    | Kindly Bachelor                    |
| Aunt MATILDA . . . . .                    | A Maiden Lady                      |
| JACK . . . . .                            | Her Nephew                         |
| WILLIAM R. PAGE                           |                                    |
| 9. American Students' March . . . . .     | <i>Lansing</i>                     |
| BANJO CLUB                                |                                    |
| 10. Manuela Portugese . . . . .           | <i>Reiter</i>                      |
| MANDOLIN CLUB                             |                                    |
| 11. Technology . . . . .                  | { <i>Words, C. W. Renshaw, '99</i> |
|   | { <i>Music, L. B. Haworth, '02</i> |
| GLEE CLUB                                 |                                    |

The clubs are in unusually good training this year, and in addition to the programme gave a number of pleasing encores. The introduction of an impersonator was an innovation not altogether acceptable to a number of the audience, who would have preferred to see the programme limited entirely to musical numbers.

After the concert the members of the clubs and a number of their friends were given an informal reception at the Technology Club. President and Mrs. Pritchett and Mrs. Francis H. Williams received.

The officers of the clubs are as follows: Mortimer B. Foster, '01, president; Charles A. Whittemore, '01, vice-president; Henry N. Hudson, '01, manager; Robert B. Morton, '01, secretary; Roger D. Babson, '03, treasurer and assistant manager. Henry K. Hooker, '02, is leader of the Glee Club, and Claude E. Patch, '02, manager. Frederic R. C. Boyd, '01, is leader, and Kenneth Lockett, '02, manager of the Banjo Club. John R. Brownell, '01, is leader, and Albert W. Higgins, '01, manager of the Mandolin Club.

At a meeting of the Institute Committee, held in the Trophy Room on Monday, December 3, President Lawrence read a letter from Dr. Pritchett, suggesting that an event be substituted for the cane rush in the annual struggle between the Sophomore and Freshmen for class supremacy.

President Lawrence appointed a committee, consisting of L. S. Cates, chairman, P. G. L. Hilken, P. R. Parker, and C. L. Homer, to consider the question of abolishing the cane rush and substituting some other event. This committee will confer with the Advisory Council on Athletics, and will be glad to receive suggestions from any one interested in the matter.

Mr. L. S. Cates was elected representative to the Advisory Council on Athletics. Mr. I. R. Adams was elected representative to the Association of Graduate Class Secretaries. President Lawrence appointed J. C. Fruit and C. J. McIntosh assistant custodians of trophies.

## FOOTBALL SUMMARY

The scores and summary of the 'Varsity's successful season follow : —

|   |     |           |    |                     |    |
|---|-----|-----------|----|---------------------|----|
| October                                   | 5,  | M. I. T., | 6  | Exeter,             | 6  |
| "   | 10, | "         | 0  | Brown,              | 22 |
| "   | 13, | "         | 6  | N.H. State College, | 0  |
| "   | 20, | "         | 35 | Stevens Institute,  | 0  |
| "   | 27, | "         | 0  | Tufts,              | 0  |
| "   | 31, | "         | 17 | Worcester, P.I.,    | 2  |
| November                                  | 3,  | "         | 0  | Amherst,            | 18 |
| "   | 17, | "         | 0  | Holy Cross,         | 16 |
| "   | 21, | "         | 17 | Burdett College,    | 0  |
| Total score, M. I. T., 81; opponents, 64. |     |           |    |                     |    |
| Games won, 4; lost, 3; tied, 2.           |     |           |    |                     |    |

Mr. Samuel Cabot, a member of the Corporation, has offered a medal for the man who, for the year, shows the greatest gain in development. Measurements will therefore be taken now and again in the spring of the year. As it is not the greatest strength, but the greatest gain, which counts, all have an equal chance; and the medal is well worth trying for. Classes are conducted every afternoon from four to six o'clock except Saturdays.

## THE CLEOFAN

The Cleofan, which is the only woman's club at the Institute, has started in again this year with a largely increased membership. The club is a social one, and holds afternoon teas every Friday. It recently gave a most successful reception to Dr. Henry S. Pritchett, the new President. The affair was held in the Margaret Cheney Room at the Pierce Building.

The Cleofan held its annual election in October, electing the following officers: president, Miss Anna B. Gallup, '01; vice-president, Miss Edith A. Beckler, '02; secretary, Miss Ava M. Stoddard, '03; treasurer, Miss B. C. Hill.

## THE MINING ENGINEERING SOCIETY

The Mining Engineering Society opened its fourth year on Thursday, November 1. President Pritchett talked to the society upon matters of general interest. During the year there will be lectures and talks by different scientific men upon subjects in line with mining and metallurgy.

## CLASS OFFICERS

The class of 1902 held its annual election through the mail this year.

President Pritchett has forbidden class elections taking place in the halls from now on, because he wishes to remove every cause that may lead to "rushing" between the Sophomores and Freshmen.

The results of the election were as follows: president, Louis S. Cates, of Newton Centre; first vice-president, Kent J. Stow, of Buffalo; second vice-president, Paul Hansen, of Washington; secretary, Charles W. Kellogg, Jr., of Brookline; treasurer, Clyde R. Place, of Mount Upton, N.Y.; directors, Charles H. Boardman, Jr., of Lynn, Farley Gannett, of Washington; Institute Committee, I. Rayne Adams, of Cambridge, J. Clyde Fruit, of La Crosse, Wis.

The Sophomore Class has elected the following officers: president, R. M. Field; first vice-president, L. H. Lee; second vice-president, H. T. Winchester; secretary, J. T. Cheney; treasurer, B. H. Miller; directors, F. G. Babcock and G. M. Harris; Institute Committee, C. J. McIntosh and Paul P. Parker.

## THE GRADUATES

## M. I. T. ALUMNI ASSOCIATION

The Executive Committee of the alumni announces the election of the following honorary members: Professor John D. Runkle, Professor James M. Crafts, and President Henry S. Pritchett. They also announce the election of thirty-one associate members.

The annual dinner of the Alumni Association was held at the Hotel Brunswick, Saturday, December 29, at seven o'clock P.M. This was a particularly notable occasion, as it was the first formal appearance of President Pritchett before the whole body of the alumni. Added interest was given to the occasion by the fact that, in addition to President Pritchett, Honorable John D. Long, Secretary of the Navy, Honorable David J. Hill, Assistant Secretary of State, and Lieutenant Governor Bates spoke. A business meeting at 5 P.M. preceded the dinner. The usual committee reports were made, and elections were held with the following result:—

President, Charles T. Main, '76; vice-president, Harry H. Campbell, '79; secretary, Edward F. Miller; member of the Executive Committee, Charles A. Stone, '88; Alumni Committee on the School (for three years), Charles F. Pritchard, '76; for Committee on Associate Membership (for three years), Harry W. Tyler, '84, William Z. Ripley, '90; for member of the Advisory Council on Athletics (for three years), Frank H. Briggs, '81; for trustee of the alumni Fund, Frank L. Fuller, '71.

## REPORT OF WALKER MEMORIAL COMMITTEE

No active work was undertaken by the Walker Memorial Committee during the fall, until it was possible to ascertain the attitude of the President of the Institute toward the plans of the committee. President Pritchett's hearty and enthusiastic support gave them, however, the strongest encouragement; and since November active work has been carried on, especially

through the associate members of the various classes. Probably the greatest difficulty with which the committee has had to contend has been the lack of definiteness in the propositions which they could offer to the alumni, and this difficulty the support of the President and the attitude of the Corporation have now removed. The unfortunate accident which occurred in the cane rush this fall made more obvious than ever the need that the authorities of the Institute should give systematic attention to the physical condition of its students. President Pritchett, therefore, asked the Corporation, not only for a grant of land upon which a gymnasium could be placed, but also for an appropriation to provide for a competent trained director, with a view to a definite course in gymnasium work ; and in December the President was authorized to state to the alumni that the Corporation would set aside 10,000 square feet of the land on Trinity Place, corner of Stanhope Street, or, if preferred, 48,000 feet on Garrison Street, for a site for the Walker Memorial Building, on condition that \$100,000 should be subscribed by July 1, 1901, for the erection of the building. The Executive Committee undertook, also, to provide a suitable man to conduct a department of physical culture.

The Faculty of the Institute has been requested to confer with representatives of the alumni, and to submit to the Executive Committee a plan for the Walker Memorial Building and for its use. A special committee has already been appointed by the Faculty for this purpose.

The effect of this action on the work of the committee cannot fail to be most stimulating. The hearty co-operation of the Institute authorities is insured in just such a broad and comprehensive plan as the alumni most desired. As President Pritchett has stated, the solution of the problem of physical training remains for the future ; and the chance is open to the Institute to make as great and far-reaching innovations in this field as it has already made in technical education. President Pritchett's views, as set forth in his address at the Alumni Dinner, may be quoted somewhat more fully : —

“In most American colleges and universities little attention has been paid to a general problem of physical culture. Either there has been no attention to athletics and to exercise or else the effort has been to develop to an undue extent certain games. The time has now come when the governing body of the Institute feels that it must deal with the physical education of its students as well as with the training of their minds. For a long time we have realized that there should be some systematic instruction for students as to the care of their health and of their bodies, but the way has not heretofore seemed clear for dealing with this problem. The purchase of an additional tract of land adjoining the Engineering Building has now made it possible for the Cor-

poration not only to join hands with the alumni in the establishing of the Walker Memorial Building, but also to provide a means by which that building shall be made effective and valuable to the student life. The Corporation has voted to establish a department of physical culture, which shall have for its object, not the development of athletics in the acute form, but the instruction of the entire student body in the care of health ; which shall inform them as to proper rules of exercise ; which shall make a physical inspection of each student who enters, and shall prescribe for him in the light of such inspection the exercise suitable to his need. At the head of the department shall be a man able to advise students, not only concerning their games and sports, but also concerning their diet and exercise and the general care of their bodies. In other words, a department which shall do for the physical side of students what the other departments do for the intellectual side. No greater need exists in the Institute to-day than this. As Herbert Spencer says, ' Since vigorous health and its accompanying high spirits are larger elements of happiness than any other things whatever, the teaching how to maintain them is a teaching that yields in moment to no other whatever.' In this effort the Corporation has in mind the rational solution of the problem of the conservation of health along lines consistent with the highest scholarship and the highest efficiency.

Of this department the Walker Memorial Building, which you have planned, is to be the centre. It is to be, not a gymnasium in the narrow sense, but a building which shall administer to the social life of the students as well. Heretofore, in your efforts to raise money for this building, you have been working somewhat in the dark, without knowing definitely just what the building would be used for nor where it would be placed. The action of the Corporation this week has now made this question a perfectly definite one. Not only has it voted to establish a department of physical culture, but it has voted a site for the Walker Memorial Building as well.

It will be seen that this action of the Corporation not only gives definiteness and purpose to the effort which you have been making, but also assures the success of that effort, once the Walker Memorial Building has been obtained. The contribution of the land will amount to not less than \$60,000, while fully \$150,000 will be required as an endowment for such a department. The Corporation has therefore contributed \$200,000 to make the memorial which you are preparing for General Walker of the greatest possible value to the student body. All this action is predicated on the condition that the \$100,000 to build the Walker Memorial Building shall be subscribed before July 1, 1901. With all uncertainty removed, with a definite end in view,



with an object like this, of such moment, to be accomplished by the success of your subscriptions to this undertaking, there is just one thing to which the alumni and former students should bend their efforts at this moment; and that is to the completion of this subscription of \$100,000. \$40,000 of it has already been subscribed by about one-tenth of your number. This \$60,000 yet remaining ought to be subscribed at once. In this matter I ask the aid of every man who loves the Institute of Technology and who has ever studied in its halls."

A new motive is now added for the early completion of this work of the alumni. First and foremost, of course, comes the need of the alumni and past students to express their love for the leader who gave himself to their service with such splendidly unselfish devotion. Secondly, comes their desire to repay, in some measure, the debt they owe to the school which has done so much for them, by giving to it the one thing most needed for its progress and development. Now, however, it becomes essential for their own honor and self-respect that the past students of the Institute should carry through successfully this work that they have undertaken, and to whose completion they are doubly pledged by the confidence reposed in them by the Faculty and Corporation.

It should be noted that the action of the authorities of the Institute is contingent on the consummation of our subscription by July 1, 1901. There is, therefore, but a short time left in which to bring the subscription to a conclusion.

On the 29th of December, before the Alumni Dinner, the total subscriptions amounted to \$40,879, contributed by 536 men. During the dinner between two and three thousand dollars were added to this sum, and on that occasion a further addition of fourteen subscribers of \$500 each was announced by the President. At the close of the year 1900, therefore, about half the total subscription has been completed through the public spirit of somewhat over one-tenth of the total number of alumni and past students. The remaining work of the committee consists in the presentation to the other nine out of ten men of the importance of prompt action by them.

In order to do this, the committee relies on the continuance of the efficient work of the associate members of the various classes. It is also intended to secure the assistance of representatives of the various fraternities in presenting the opportunity for the subscription to the members of those organizations, and the committee has been greatly pleased with the cordial response so far received. In the next list of subscriptions a statement will be made, showing the amount contributed by fraternity men.

About the 10th inst. a new general circular will be issued by the com-

mittee, enclosing copies of President Pritchett's address and a revised table of subscriptions, the resolves and votes of the Corporation and the Alumni Association, and a plan showing the location of the Institute buildings and the site on Trinity Place assigned by the Corporation to the Walker Memorial Gymnasium. If this circular meets with the cordial response to be confidently anticipated by the committee, definite plans for the gymnasium will be at once set on foot in pursuance of the following votes of the Alumni Association at its meeting, Dec. 29, 1900:—

*Voted*, "That the Walker Memorial Committee be authorized to represent the Alumni Association in conference with the Faculty as to the plan for the Walker Memorial Building and for its use, in pursuance of the vote of the Corporation."

*Voted*, "That the Executive Committee be requested to authorize the transfer of Funds by the Walker Memorial Committee to the Treasurer of the Institute, to be applied toward the erection of the Walker Memorial Gymnasium, whenever the plans of the Corporation and Faculty for the character and organization of the same shall have been accepted by the Walker Memorial Committee."

It is hoped that within three months the subscription will be so nearly completed that plans and elevations of the Walker Memorial Gymnasium may be published in the next number of the REVIEW. Whether this hope can be realized depends, not on any work of a few men, but on the general co-operation of the body of former students of the Institute and the alumni. It is not large subscriptions the committee desires, but many small subscriptions. To quote once more from President Pritchett's address:—

"After all, the highest tribute to General Walker would be, not that a Memorial Building has been erected, for such a building might be erected by one who never saw him and who never knew him; but it would be a monument beyond compare that such a building has been erected by the efforts of every man who had ever studied in the Institute of Technology. What is wanted is, not so much the money of any man, but the individual service of the four thousand graduates and students who have gone out from these halls; and with this co-operation you will erect, not only a splendid monument to a splendid man, but you shall find a source of inspiration of your own, compared to which money has no value."

## NORTH-WESTERN ALUMNI ASSOCIATION

The December meeting of the Association was held at "The Bismarck" on Monday, December 17, at 6.30 P.M. Professor Farrington of the Field Columbian Museum, who has made valuable investigations as to the question of the age of the earth, spoke; and Mr. Lansingh gave a talk on the Paris Exposition. Captain Bogardus gave an account of the visit of the Original American Rifle Team to New England.

Mr. Litchfield writes as follows: "The monthly meeting, January 16, will be of unusual interest, and will close our year,—a very satisfactory and successful one in point of attendance, enthusiasm, and financial report. We expect that a large minus, which has always preceded the treasurer's report, will become a small plus, with a very encouraging outlook for next year. Our annual banquet will probably be held about the first of February."

## THE WASHINGTON SOCIETY OF THE M. I. T.

The society held an informal dinner on Tuesday, December 18, at "Freund's," 85 10th Street, N.W. The dinner was followed by the annual election of officers and the transaction of other business. During the evening, copies of the REVIEW were presented for inspection.

## THE TECHNOLOGY CLUB

On Monday evening, October 8, the annual meeting of the Club was held. At this meeting the reports of the treasurer and the secretary were read. The treasurer's report showed a decided improvement in the club's finances, that of the secretary showed a healthy condition in regard to membership. While some have been obliged to resign their membership in the club, others have joined, older alumni as well as recent graduates and members of the present Senior class, members of the Junior class not becoming eligible until the second term. After the reading of the reports the report of the Nominating Committee was read and adopted, the nominees being elected by ballot. The officers elected were as

follows: secretary, Walter Humphreys, '97; treasurer, Walter E. Piper, '94; members of council for three years, C. Frank Allen, '72, Dana P. Bartlett, '86, James P. Munroe, '82, William Z. Ripley, '90, Francis H. Williams, '73. The council met after the adjournment of the annual meeting, and elected James P. Munroe, '82, president, and Francis H. Williams, '73, vice-president.

The season of club nights began with the receiving of election returns on the evening of November 6. The bulletins were received by telephone, and exhibited by means of the lantern. The monotony of the reports of such a number of electoral districts in such a city, reporting a majority for one or the other candidate, was broken by illustrations made by two club members, who proved themselves to be "lightning artists" and cartoonists to no small degree. Welsh rarebit was served during the evening.

The evening of the college torch-light parade was made "Ladies' Night" at the club. Special arrangements were made whereby a large number of members were able to take dinner before viewing the parade from Rogers or Walker. Cards of admission were distributed to club members. Immediately after the parade a lunch was served in the dining-room. A number returned to the house and enjoyed themselves.

The first "Smoke Talk" of the season was given by Dr. Poultney Bigelow, F.R.G.S., who spoke most entertainingly of "The White Man in the Tropics." The one hundred and fifty present keenly appreciated the frankness of the speaker. They were given an intelligent criticism of the management of our new possessions and the method of dealing with the Filipino rebellion.

The second "Smoke Talk" was given on Tuesday evening, December 4. A large audience enjoyed hearing Mr. Ernest Temple Hargrove, of London, tell of his experience in South Africa, and of his impressions of the Boers and their leader, Paul Kruger. Mr. Hargrove's familiarity with the historical facts of the Boer War, with his manner, made his remarks most convincing.

## NEWS FROM THE CLASSES

1872.

PROF. C. FRANK ALLEN, *Sec.*  
Mass. Inst. of Technology, Boston.

B. E. Brewster has recently engaged in the real estate business in Boston, entering into partnership with his brother, under the firm name of J. F. F. & B. E. Brewster, and with an office at 15 Exchange Street. This does not interfere with the business of stock-raising which Brewster has successfully carried on in the West for many years.—Brad. H. Locke made a flying trip through Boston not long since, but did not find time to see his friends. A short time ago Locke made a trip away off to Abyssinia, to examine mining properties for some of his clients.—Of the twelve graduates of this class, a very large proportion have been permanently away from Boston for a considerable length of time, and for business purposes. Minot, Shepard, and Ward are, in fact, the only ones who have stuck to Boston; and, of these, Minot was abroad several years for study. How thoroughly the class scattered may be seen from knowing where

the others have been. Allen has been in Rhode Island, Ohio, and as far west as Colorado and New Mexico; Brewster, in Wyoming, Colorado, and Nebraska; Emmerton, in Illinois and Ohio; Dodge, in Ohio until his death; Herrick, in Pennsylvania; Hodge, in Kentucky and Virginia; Locke, in Colorado; Patch, in Michigan and later in Buffalo, N.Y.; Soule, as far south as Virginia and as far west as Illinois. All this tends to show what most of us know already, that the Institute's influence is exerted largely, throughout the entire country, and is by no means local in its character.

1873.

SAMUEL E. TINKHAM, *Sec.*  
City Hall, Boston, Mass.

W. Dale Harris is president of the Montreal Terminal Railway.

1874.

CHARLES F. READ, *Sec.*  
Old State House, Boston, Mass.

The regular quarterly lunch of the Class Association was held

on September 19, at 1 P.M., at Marliave's restaurant, Boston, thirteen members being present. The lunch, which was a success, is an institution which has evidently come to stay, and the idea is respectfully submitted to the various class associations of the Institute.—Elbridge L. Brown, who has been for many years a civil engineer in Brockton, Mass., has opened an office at 53 State Street, Boston, and has become a resident of Newton.—Col. Samuel P. Colt has been recently elected a director in the American Woollen Company and the National and Providence Worsted Mills. He has become one of the noted financiers of New England, being at the present time president of the Industrial Trust Company of Providence, R.I., which he organized, and president or director of more than a dozen of the leading rubber and telephone companies and banks in or about Providence.—William B. Dowse, of the Metropolitan Rubber Company, New York, was in Boston recently, and called upon the secretary.—Harold W. Stevens, who has devoted his entire life, since leaving the Institute, to the banking business, has been recently elected

president of the Hartford National Bank of Hartford, Conn.

1875.

E. A. W. HAMMATT, *Sec.*

53 State Street, Boston, Mass.

The subscriptions for the Walker Memorial Gymnasium do not materialize as rapidly as they ought from members of this class. There are still a good many more who could contribute sums ranging from ten to one hundred dollars, and the secretary hopes to hear from them soon.—I was pleasantly surprised to get a line from T. H. Bakewell a few months ago, as it is several years since I had heard from him. He is, or was, president of the Paterson Central Railway Company of Paterson, N.J., director of Pittsburgh & Birmingham Track Company, director of Niagara Falls & Lewiston Railroad, and is vice-president and secretary of the Duquesne Steel Foundry Company, Pittsburgh, Pa., and holds membership in some six or eight clubs.—I shall be obliged to any one who can give me the present address of any of the following men: Walter C. Bates, G. F. Belden,

Henry M. Bingham, Charles O. Bradford, William H. Bush, Christopher A. Church, Charles H. Cochran, Caleb L. Cunningham, Joseph L. Dane, Albert C. Duncklee, Frank Evans.—W. C. Edes is assistant civil engineer of the Southern Pacific Company; and his address is 4 Montgomery Street, San Francisco, Cal.

1876.

JOHN R. FREEMAN, *Sec.*

4 Market Square, Providence, R.I.

Professor W. O. Crosby passed the early part of the summer vacation in a study of the zinc mines in the vicinity of Joplin, Mo., and in September extended his geological studies briefly in Utah and Montana.—Charles R. Fletcher is actively interested in the Faraday Company of Boston, which controls his patents for the electro-deposition of copper in thin sheets for architectural and other purposes. An extension of the present experimental plant at Chelsea is to be made very soon.—John B. Henck, Jr., has completed his work in charge of electric railroad construction in the vicinity of Flushing, N.Y.; but mail directed to Flushing will still

reach him.—Frank W. Hodgdon, chief engineer of the Massachusetts Harbor and Land Commission, visited England and the Continent last summer, and made a careful study of docks and harbor improvements at Liverpool and other ports with particular reference to the proposed improvement of the Commonwealth's dock facilities.—Charles T. Main has very recently visited California to make expert investigation of certain extensive water power developments and electric power transmissions now in construction.

1877.

RICHARD A. HALE, *Sec.*

Lawrence, Mass.

Arthur G. Everett, architect, of the firm of Everett, Cabot & Mead, is a member of the Board of Pauper Institutions Department of the City of Boston.—The Maryland Steel Company, of which F. W. Wood is president, has been developing a large export trade in steel rails. In addition a large amount of steamer construction is in progress. A force of three thousand five hundred men is at present employed.

1879.

HARRY H. CAMPBELL, *Sec.*

Steelton, Pa.

The class of 1879 has again lost one of its graduate members by death. On October 24, Arthur H. Metcalf died at his home in Pawtucket, R.I. Graduating in the Mechanical Engineering Department, he immediately entered into his professional life in Pawtucket. In 1883, when the Campbell Machine Company was started in Pawtucket, he became identified with it more in a business than an engineering way. He also became interested in the telephone patent question, and finally became known as one of the best patent experts in the United States, being called upon to testify in patent cases in Boston, New York, Philadelphia, and other large cities. The honest, manly qualities which he showed while a student at the Institute of Technology, intensified by his training at this school, made friends for him in his future life, and made him a power in the community. The following extracts from the address delivered by his pastor, Rev. F. W. Hamilton, D.D., at the funeral services, show how truly he carried

the flag marked by the traditions of the Institute,—honesty, power, and labor: "Dear friends, the duty that falls to me to-day is not an easy one; and yet I think I would not have it fall to other hands. It is not an easy one for me, because there is so much of my life here. I shall never forget, when I first undertook the duties and responsibilities of my profession in the first parish to which I was called, how I was received into the home of our friend; and I remember that almost at the very first Arthur took pains to tell me, in most emphatic way, how glad he was that I was to come to lead the work in which he was interested, to tell me how glad he was to have as the leader in the church a man of his own years with whom he felt that he could have much in sympathy, to assure me that I should have his sympathy and his utmost co-operation; and from that day to this I have always relied upon that sympathy and co-operation, and I have never known it to fail me. Some of you, who have owed much to such associations in your own youth, when your own lives were opening, know, perhaps better than I can tell



you, what he was to me; and I am sure that he filled a place in my life which no one else ever can fill,—the first coworker of my own age, the first to give me the hand of perfect sympathy, the most faithful servant and friend that ever a man could have. And I say ‘servant’ advisedly, because he wanted to serve me as his friend and leader; and there was nothing which I could ask his hand to do or his brain to plan that he was not more willing to do than I ever could be to ask him. And I think that in those words we have the key to much of his life; for, as we worked together, I very soon came to see that I had to do with a rare and unusual nature,—rare and unusual in many ways. He was rare in the scope and the grasp of his mental powers. I think I have never known a man who possessed more fully that rarest of intellectual accomplishments,—the power of seeing the thing which was essential in a complicated problem or a perplexing situation, and holding to that thing until the problem was solved and the situation had resolved itself. It was that which gave him the place in the world

which he afterward came to fill. It was that which made for him the successful professional life which you and I know him to have had. It is one of the rarest as well as one of the most valuable of the intellectual qualities which a man may have. And then I very soon came to see how rich were the charms of his social nature. I think I never knew a man who had so keen a sense of humor. I think I never knew a man who entered so fully into all that was really worth while in the social pleasures and delights of human life. The best of companions, the most sympathetic of friends, and yet this power to enter into the joyous life of the world was not a shallow and frivolous one. It was not simply the frothy spirits of the youth who is seeking for a good time. I knew (although he never told me),—I knew how much of his own life had been shut away when the grave closed over that beautiful, gracious woman whom he had hoped to make his wife. I knew how much of deep feeling there was underneath this power of entering into the life of those who were living around him, and it

showed me more of the real power of his life than almost anything else that I ever saw in it. And then I began to see that underneath all this readiness to adapt himself to social forms and conditions there was a principle which would never be shaken. There were certain things which he felt to be right which no temptation could ever induce him to forsake. There were certain things which he conceived to be other than right which no temptation could ever induce him to participate in. I began to see how firm was his trust in his heavenly Father, how deep his interest in those things which seemed to him the working out of God's plan for his children, how earnest his desire to be on God's side and to do God's work in the world as a Christian man." Mr. Hamilton then continued with words of consolation to Arthur's relatives and friends, and closed this just and beautiful tribute with the following words: "And, by and by, as our eyes accustom themselves to the twilight in which we must go, we can see these things; and the old

faith will assert itself stronger than ever, and the old life will tingle in us, and over this grave we shall write Paul's great word, 'Victory,' and we shall think of him as one who has finished the task allotted him to do, has won the battle allotted him to fight, has laid down his arms and rests in triumph in his tent."

E. C. M.

1881.

MAJOR FRANK H. BRIGGS, *Sec.*

2 High Street, Boston.

Frank H. Briggs is a member of the Republican State Committee of Massachusetts for 1900 and 1901.—Mrs. Julia E. Duff, wife of John Duff, M.D., of 5 Dexter Row, Charlestown, Mass., is one of the Democratic candidates for School Committee. She was born in Boston, and graduated from the Girls' High and the Boston Normal Schools. Was fourteen years a teacher in the Boston public schools. She is a member of the Woman's Club, the Associated Charities, the Woman's Educational and Industrial Union; and her qualifications heartily indorse her candidacy.

1882.

WALTER B. SNOW, *Sec.*

Watertown, Mass.

The first of the season's informal dinners at the Technology Club was held on the evening of November 23. Seven members were present, —Darrow, French, Jenkins, Mansfield, Munroe, W. B. Snow, and Warren.—Joseph H. Walker has removed from Fairport, Kan., to San Diego, Cal.—Albert C. Brackett is now connected with Edward T. Harrington & Co., real estate dealers, 35 Congress Street, Boston.—Alice B., wife of John F. Low, died at Chelsea, Mass., on October 28.—A. L. Darrow was the architect for a summer residence recently erected by George E. Warren at Brookfield, N.H.—The class was represented at the inaugural exercises of President Pritchett by Brackett, Darrow, Low, Jenkins, Mansfield, Munroe, H. F. Ross, W. B. Snow, and A. W. Walker. J. P. Munroe was a member of the Corporation Committee in charge of the exercises. Of the seven present at the dinner on November 23 it appeared that two — Jenkins and Warren — were enthusiastic automobilists,

that Mansfield is practically interested as the manager of the delivery department of the New England Electric Vehicle Transportation Company, and that French has substantially discarded the bicycle in favor of the naphtha launch.—George W. Mansfield was married on September 15, 1900, to Sallie Thompson Cargill, of Erie, Pa.

1883.

HARVEY S. CHASE, *Sec.*

8 Congress Street, Boston.

Chase is retained as expert for the city in "Holyoke Water Power Company [gas and electric plants] v. City of Holyoke"; is examining the accounts of a New York and Boston brokerage house, with branch in London; and has recently been appointed upon the committee to consider "Uniform Municipal Accounting" of the National Municipal League.—A class reunion at Buffalo Fair in July has been proposed.—"Natick Republicans have every reason to feel proud of the victory and of the manner in which the campaign has been conducted. The principal fight came upon the representative question, and

the contest was a warm one. Early in the campaign, indications pointed to the defeat of the Republican candidate, and the Socialist nomination complicated matters somewhat; but the sober second thought of the Republican party convinced them that Mr. Gale's record was an excellent one, which entitled him to the full Republican support, and all personal differences were set aside, and for many days before election his candidacy gained in strength. Mr. Gale is to be congratulated upon his handsome vote, the largest received by any representative candidate in many years; and with the experience gained last year he will probably render a service of which all his townsmen may justly take pride." *Natick Bulletin*, November 9, 1900.

1884.

DR. AUGUSTUS H. GILL, *Sec.*  
Mass. Inst. of Technology, Boston.

The secretary was recently called to Chicago in connection with some work for the People's Gas Light and Coke Company of that city. While there, he made a point of looking up some classmates. They were

all very much interested in the inauguration, in the new purchase of land by the Institute, and in its growth in general.—Fitch is in the construction department of Swift & Co., and had just returned from a trip in the interest of the company to Louisiana.—T. W. Robinson is in Chicago instead of Joliet, with the Illinois Steel Company.—Baldwin has an office not a stone's throw from Robinson in the Monadnock Block, and was very busy with the changes in "The Alton Road" at Venice.—The subscription of the class to the Gymnasium Fund amounts to \$1,200, but is still quite below the quota desired; namely, an average of \$100 for every living graduate.

1885.

PROF. E. B. HOMER, *Sec.*

717 Tremont Building, Boston.

Charles A. Brown telephones that he is still at the old stand on Congress Street, and that the export paper trade with England and Australia holds its own. Charlie is to be congratulated on his growing family,—a girl this time.—Robert R. Goodrich has temporarily given up his active work in mining

engineering, and is studying at the Institute, taking a stiff course in mechanical engineering. He intends to turn his theoretical studies to account immediately after graduating this year, by taking up new applications of machinery to mining operations.—E. B. Homer has recently been appointed a member of the Executive Committee of the Boston Society of Architects. In addition to Institute duties, he is completing a grammar school at Waverley, Mass., and a house at Belmont for A. L. Merrill, '85; has just finished a large house for A. J. Wellington, Newton; and has on the boards drawings for a \$40,000 Memorial Library. On November 23 he lectured at the Woman's Educational and Industrial Union on "How to look at a Building."—Heywood Cochran is with Cochran & Powell, manufacturers agents, Room 209, Swank Building, Johnstown, Pa.—Everett Morse has just added buildings and machinery to the value of \$120,000 to both the Expanded Metal and Simplex Plants, in order to take care of the increasing business. After sev-

eral years of close attention to business, he intends at last to take a real outing, and is going to start January 26 for a five weeks' trip to the West Indies, Trinidad, Porto Rico, and various ports not yet scheduled.—Herbert G. Pratt is still with the Samson Cordage Company, and has been busily putting in new power and in building a new mill one hundred feet square at the works at Shirley.—Lyman Sise has recently lost his partner, Mr. Burr, through a fatal accident in the Middlesex Fells.—George F. Steele reports that the business of his department of the General Electric Company is increasing very rapidly. The past six months' work is equivalent to the whole of the previous year. His work is greatly varied. Power transmission in mill work, electric distribution plants, government work on shops and new vessels, give a great opportunity for studying new and interesting problems. Some of the recent contracts he has been connected with are the Rope Walk, Boston Navy Yard, costing \$70,000, without boilers; changing over the Whitney Machine Works at

cost of \$40,000 for electrical part alone; the turret, turning motors and apparatus for the "Olympia," \$40,000, and the electric motors and electric apparatus for the monitor and cruiser building at the Bath Iron Works.—E. L. Rawson is still superintendent of buildings for Winslow, Wetherell & Bigelow, architects.—H. P. Talbot made a tour of the Great Lakes and down the Mississippi River last summer. For some time he has had general charge of the Department of Chemistry at the Institute. The endless duties of his position have prevented his sending the secretary many interesting chemical formulæ for insertion in this number.—F. H. Newell addressed the students of the engineering courses, December 10, on the "Investigation of the Water Resources of the United States, and the Reclamation of the Arid Lands." Newell's work as chief hydrographer of the United States Geological Survey has been remarkably important and successful.—A. D. Little announces that he has formed, under the firm name of Little & Walker, a copartnership with

W. H. Walker, Ph.D. (Göttingen), recently instructor in analytical chemistry at the Massachusetts Institute of Technology. The office and laboratory will be, as heretofore, at No. 7 Exchange Place, Boston; and the firm will devote itself to a general analytical and consulting practice, with especial reference to the chemistry of manufacturing and expert work in patent causes. Little is to be married January 22, and will live in Brookline.

1886.

PROF. ARTHUR G. ROBBINS, *Sec.*  
Mass. Inst. of Technology, Boston.

J. Waldo Smith, in addition to the duties of engineer and superintendent of the Passaic Water Company, has recently accepted the position of chief engineer of the East Jersey Water Company. Mr. Smith is thoroughly familiar with the plant of the East Jersey Company, as he was employed as assistant engineer during the construction of its reservoirs and pipe lines.—The engagement of Colonel Frank L. Locke to Miss Mary B. Kendall, of Malden, is announced.—J. Frank Seavey

is with the American Steel and Wire Company of Worcester, Mass.—Charles H. Woodbury's address is Harcourt Building, Irvington Street.

1887.

EDWARD G. THOMAS, *Sec.*

4 State Street, Boston.

T. W. Sprague is at present in Southern California, making his headquarters at Los Angeles, from which place he has made several visits to the properties of the Arizona & New England and Nevada & New England Consolidated Mining Companies, of which he is treasurer. He will probably be away for some time yet.—H. S. Adams and E. G. Thomas are developing the Sunnyside Placer Mine in Plumas County, Cal., and have spent the entire autumn at the property, in equipping it with modern machinery and methods.—Fred Thompson is in the United States Navy Yard, Norfolk, Va.—In the *Pan-American Herald* for October and November, 1900, is given an interesting account of the Electrical Exhibits that are to distinguish the Pan-American Exposition at Buffalo above all its predecessors. The article

is by George F. Sever, who is in full charge of the details, and of whom the *Herald* gives an excellent picture. The exhibit is to be historical as well as commercial, and it is proposed to make it especially educational by inviting students from technical schools and colleges throughout the country to attend.

1888.

WILLIAM G. SNOW, *Sec.*

704 Arch Street, Philadelphia, Pa.

Guy W. Currier, of Lawrence, has been re-elected to the Massachusetts Senate for the fifth district.—Harold Binney, 31 Nassau Street, New York, is very busy with his patent law practice. He has recently removed from Morristown to 30 West 15th Street, New York City.—W. G. Besler, who left the C., B. & Q. R.R. about a year ago to become superintendent of the main line of the Philadelphia & Reading, was on September 22 appointed general superintendent of this company and the Atlantic City Railroad Company. His headquarters are at Reading, Pa.—William G. Snow has resigned from the S. Homer Woodbridge Company to be-

come heating and ventilating engineer for Francis Bros. & Jellet, 704 Arch Street, Philadelphia, Pa. Davis Williams Company, New York, N.Y., has recently published his book on furnace heating.—W. L. Dearborn has been appointed contracting engineer of the American Bridge Company for the Gulf States, with headquarters in Godchaux Building, New Orleans, La.—J. C. T. Baldwin returned to Boston, December 1. He is now with the Engineering Department of the American Bell Telephone Company, 125 Milk Street.—E. S. Webster has been abroad on a business trip.—Edgar F. Dutton is in the Power and Mining Department of the General Electric Company, Schenectady, N.Y., being in charge of marine electrical installation.

1889.

WALTER H. KILHAM, *Sec.*

3 Hamilton Place, Boston, Mass.

Francis R. Hart is president of the Cartagena-Magdalena Railway of Columbia. This is a three-foot gauge line of 105 kilometers in length, running from Cartagena on the Carib-

bean Sea to Calamar in the interior, where it connects with a line of steamers on the Magdalena River. The road is very thoroughly constructed, and is equipped with nine American locomotives and a corresponding number of cars. It was opened for public service for its full length on the 1st of August, 1894, and has succeeded in ousting that powerful competitor of the South American railways,—the overburdened *burro*, or donkey. The principal goods carried on the railway are the imported products of Europe and the United States and the exported products of the interior, consisting of coffee, tobacco, hides, ivory, nuts, cacao, cotton, minerals, and spices. Cotton is the most valuable of the exported agricultural products, and tobacco next. The staff of executive officers of the railway are American and English, as are also the chief employees, engine drivers, conductors, terminal superintendents, etc. The office accounting force is partly Columbian and partly foreign. The brakemen and stokers are either Columbians or Jamaica negroes. The railroad also owns splendid terminal facilities



on the harbor of Cartagena. A complete description of the line was printed in the *Technology Quarterly* for June, 1899. Hart is also vice-president of the Old Colony Trust Company, Boston.—Richard Hooker is with Alden & Harlow, architects, Pittsburg.—The secretary would be glad if members of the class of '89 who receive the REVIEW would overcome their natural modesty sufficiently to send him such items of personal interest as would be interesting for publication.

1890.

GEORGE L. GILMORE, *Sec.*

Lexington, Mass.

W. L. Creden, who for several years was in the West, is now engaged in a wholesale house at 94 Essex Street, Boston, Mass.—Joseph B. Baker, of Newton, Mass., was married November 14 to Miss Alice Phillips Pattou, eldest daughter of Professor Ange A. Pattou, of 25 West 65th Street, New York. Mr. and Mrs. Baker will reside in Boston.—Mr. and Mrs. George E. Hale are to be congratulated on the arrival of a son, William Ellery Hale, born November 5.

1891.

CHARLES GARRISON, *Sec.*

Lexington, Mass.

Ethel Blackwell, M.D., is secretary of "Messiah Branch Alliance" of the National Alliance of Unitarian Women, which position she has held since 1899.—Stephen Bowen, having left the Whittier Machine Company with which he was associated for seven years, is now president of John F. Brooks Company of Highlandville, Mass.—George W. Bryden has recently taken the position of superintendent of the New England Structural Company.—Roger W. Conant is with the Boston Elevated Railway Company since graduation. He has published many interesting papers in street railway magazines on street railway economy.—Howard C. Forbes is now at Springfield, Ohio, doing some engineering work for the Dayton, Springfield & Urbana Street Railway. He has recently published a paper on "Comparison of Earnings of Massachusetts Street Railways" in the *Financier*, Boston.—Harry W. Jordan has just accepted the position of chemical engineer on coke oven by-prod-

ucts with the Semet Solvay Company of Syracuse, N.Y., having left the position of manager Bowker Chemical Company, Elizabeth, N.J. [N.B. — The first to “oversubscribe” to the decennial pamphlet now being compiled by the secretary.] — Frederic T. Snyder is now acting as consulting and contracting metallurgic engineer, Mining Plant Construction. He has recently published in the *Canadian Mining Institute* a paper on “The Factors in Concentration.” — George H. Spooner announces the birth of a son, Howard Marshall Spooner, September 9, 1900. — James W. Pierce since March has been assistant engineer and superintendent of parks, Havana, Cuba (office of the chief engineer, city of Havana). — Arthur B. Stoddard died in Chicago, August 29. — Elisha B. Bird: the same clever, humorous artist as ever. See the *Herald*. — Arthur H. Alley has recently been appointed purchasing agent of the Massachusetts Breweries Company. — Arthur Howland, for six years secretary of the Anchor Electric Company, is now of the firm of Stuart-Howland Company, electrical supplies, Boston, Mass. — Margaret E. Maltby, teacher, Wellesley College, 1891-93; student, Göttingen, Germany, 1893-96; teacher, Wellesley College, 1896-97; teacher, Lake Erie College, Painesville, Ohio, 1897-98; private assistant to President Kohlrausch of the Reichsanstalt, Charlottenburg, Germany, 1898-99; teacher, Barnard College, New York, N.Y., 1900. She has published several papers of electrical research in German. — Arthur F. Shattuck has a daughter, Clara Ruth Shattuck, born July 9, 1900. — W. H. Bassett is chemist for the Newark Zinc Company, Newark, N.J. His address is 39 South Clinton Street, East Orange, N.J. — Albert L. Clough is an electrical engineer. His address is 859 Elm Street, Manchester, N.H. — A. G. McKenna is the treasurer of the McKenna Bros. Brass Company, Ltd. — W. C. Richardson is in business at 113 Congress Street, Boston. — C. W. Ricker is consulting engineer at Buffalo, N.Y. — Edward B. Stearns is in charge of the Cleveland (Ohio) office of the American Bridge Company.

1892.

PROF. SEVERANCE BURRAGE, *Sec.*

Purdue University, Lafayette, Ind.

Elisha Lee is assistant supervisor of the Pennsylvania Railroad, Parkesburg, Pa.—W. H. Lane is with William H. Perry Company of Portland, Me.—L. B. Manley is engineer of the Massachusetts Telegraph and Telephone Company, 185 Franklin Street, Boston.—R. H. Mansfield, Jr., is manager of the New Jersey factory of Cutler Hammer Manufacturing Company, Westfield, N.J.—Henry J. Sage is general superintendent of the Opalite Tile Company of Pittsburg, Pa.—The engagement of Mr. Walter M. Newkirk, of the Buhl Malleable Company, to Miss Alice Maynard Field, of Detroit, Mich., was recently announced.—Walter B. Trowbridge was nominated alderman at large for the city of Newton, Mass.—News comes from classmates in Detroit that “business is picking up considerably since our friend Bryan was laid to rest. I see Kales, Buckley, and some of the other boys occasionally, but not often. Too busy, you know,—even nights and Sundays,—nowadays.”

1893.

FREDERIC F. HAY, *Sec.*

60 City Hall, Boston.

'93 leads. We are the first class to raise our Walker Memorial Gymnasium subscription above \$4,000. At the annual alumni dinner, December 29, '93's subscription reached the total of \$4,160.60. This amount has been subscribed by seventy-six men, making the average '93 contribution \$55. It is gratifying to see the wide-spread interest taken by the class in the Walker Memorial, but, when we consider that only about one-fourth of our members have as yet made any contribution, it would seem that, with the early adoption of definite plans for the gymnasium, our present subscription should soon be largely increased. Not alone in the Walker Memorial, however, has '93 made an enviable name. At the alumni dinner we turned out nearly twice as many men as any other class, twenty-seven of our members being present, as follows: Barton, Bemis, Blake, Blood, Bremer, E. B. Carney, W. A. Clapp, Crosby, Dawes, Demond, Densmore, Fay, Frisbie, F. Houghton, A. L. Kendall, Keyes, Latham,

C. F. Morse, H. A. Morss, W. B. Page, Parks, Pickert, Spofford, Sweet, Tucker, Whiston, Whiting.—The following program has been arranged for the class for the season of 1900–1901: *Saturday, December 8, 1900*, First Informal Meeting of the class at the Technology Club, 71 Newbury Street, at 6 P.M. Dinner was served at 6.30 o'clock at a charge of 75 cents. A Smoke Talk by C. W. Sawyer was the feature of the evening. An account of this meeting will be found below. *Saturday, December 29, 1900*, annual meeting of the M. I. T. Alumni Association at Hotel Brunswick. *Saturday, February 2, 1901*, Second Informal Meeting of the class at the Technology Club at 6 P.M. Dinner (at 75 cents) will be served promptly at half-past six. G. T. Blood, '93, of the American Bell Telephone Company, will speak of "Long Distance Telephony," explaining many interesting things about this common yet little understood invention. F. W. Hadley, '93, superintendent of power plant at the South Terminal, will give a talk, fully illustrated by lantern views, descriptive of Bos-

ton's South Terminal Station, with especial reference to its power plant. *Saturday, March 16, 1901*, Annual Class Meeting and Dinner at the Technology Club. The class will have the honor of entertaining as its guest Dr. Pritchett, President of the Institute. Full particulars of the annual dinner will be given later in a class notice.—The first informal meeting of the class for the season of 1900–1901 was held *Saturday evening, December 8, at the Technology Club*. Fourteen members dined together at the usual hour. Before adjourning to the common room, Assistant Secretary Spofford made a report upon the progress of the Walker Memorial Gymnasium subscription, and the prominent part taken by '93 therein. At that date but one class ('85) excelled ours in the amount of its contribution; and it was hoped that '93 might be in the lead at the Annual Alumni Dinner, three weeks later. The event of the evening was a smoke talk in the common room, at which Charles Winthrop Sawyer, '93, spoke upon "Ancient Architectural History." In addition to his

work as a practising architect, Sawyer for several years has had charge of the second and third year evening classes in architecture at the Boston Young Men's Christian Association. His experience gained in teaching and his knowledge of architectural history and archæology combine to make him an entertaining lecturer upon subjects of this nature. The talk, illustrated by many lantern views, was listened to with great interest, and thoroughly enjoyed by all. A social half-hour brought to a close one of the pleasantest gatherings the class has held. The attendance was: Biscoe, Blood, Crosby, Dawes, Fay, H. A. Houghton, F. Houghton, A. L. Kendall, E. S. Page, W. B. Page, Pickert, C. W. Sawyer, Soley, Spofford.—Two deaths among our members have recently been reported. Frank William Adams, of Newtonville, Mass., died March 12, 1900. Dennis Edward Callahan, of Boston, died November 28, 1900. For some time prior to his death, Adams was connected with Belding Brothers, silk manufacturers, at 30 Summer Street, Boston. He will be remembered best by the members

of Course I. with whom he was associated in our Sophomore and Junior years. Callahan graduated with the class in electrical engineering, and shortly afterward took a position in the Wire Department of the City of Boston. When Wire Commissioner Murphy became City Water Commissioner about five years ago, Callahan was appointed by him a district superintendent in the Water Department,—a position which he held to the time of his death. Callahan is the second of our graduates to be taken away, the first being Miss Ballard, who died in 1897.—Last November, William W. Crosby, principal of the Lowell Textile School, addressed the Society of Arts of the Institute on "Applied Science in the Textile World," the value of the address being enhanced by the exhibition of a number of lantern slides. Crosby spoke of the great influence upon textile industries exerted by science during the century just closed, and showed that in this particular line the advance made during the past hundred years has been many times greater than that of all the preceding centuries together. He described

briefly the various processes in cotton and woollen manufacturing, from the growth and structure of the fibre, through the primitive methods of manufacture, to the complicated operations of to-day. One point especially interesting to the layman was the explanation of the difference between woollen and worsted goods. In closing, Crosby gave a short description of the Lowell Textile School, and spoke of the work being done by this recently established educational institution. A business man is reported to have said not long ago, "The Lowell Textile School has done more to make Lowell famous than all the mills in the place." However this may be, it is certain that the school is doing notable work; and it is a credit to the class that our class president bears so prominent a part in the direction of its affairs. During the past two years Crosby has delivered a number of lectures upon the subject of textile education.—John R. Burke and Miss Harriet Hallett, of Cotuit, Mass., were married October 10, 1900, their residence now being 11 Wadsworth Street, Allston, Mass. Burke is an engineer

of the Massachusetts Board of Harbor and Land Commissioners; and at an informal meeting of the Boston Society of Civil Engineers last February he presented a paper on the construction of boat harbors on the south shore of Massachusetts, which had been built under the supervision of that commission. The localities considered in the paper were Menamsha on the west end of Martha's Vineyard, Cottage City, Osterville, Harwichport, and Green Harbor. Burke explained the natural conditions attending the various localities, showed the plans of the projects, described the methods of construction and the difficulties encountered therein, and discussed the cost of the work and the general results attained by the improvements. The subject is one with which engineers generally are not especially familiar; but the person who has been in Vineyard or Nantucket Sounds when the lifting of a heavy fog has suddenly disclosed a great fleet of vessels of every description will form some conception of the vast amount of shipping which rounds Cape Cod every year, and will appreciate the urgent

need, in time of storm, of boat harbors along the Southern Massachusetts coast.—Carleton E. Davis and Miss Grace L. Bennett were married September 25, 1900.—William B. Gamble is engaged in mining investments, 1 McGraw Building, Detroit, Mich.—F. H. Howland is the Washington correspondent of the *Providence Journal*; and his address is 1417 G Street, Washington, D.C.—H. M. Phillips is with Irwin-Phillips Company of Keokuk, Ia.—F. B. Studley is engaged in private business at North Duxbury.—For some time after leaving the Institute, Walter S. Whiting was engaged in mining engineering, being connected with the Philadelphia & Reading Coal and Iron Company at Shamokin and Pottsville, Penn. In 1897 he assisted in organizing the Pottsville Supply Company, of which he is still part owner. Two years later he organized and became principal owner of the Dacosta Coal Company. He is now interested in the recently formed Milwaukee Forge and Iron Company, of which he is secretary and treasurer, with an office at Room 613, Ger-

mania Building, Milwaukee, Wis. A while ago Whiting wrote, "I haven't laid eyes on a '93 man for some time, although I should like to." Whiting came to Boston in December last and attended the Alumni Dinner.—Charles W. Taintor is at Schenectady, N.Y., where, since April, 1900, he has been connected with the General Electric Company, at first in their Testing Department and at present in the Foreign Department, in which his work is principally along commercial lines. Taintor's address is 205 Union Street, Schenectady, N.Y.—Theodore T. Dorman, while a member of the examining corps of the United States Patent Office, took a course at the Law School of the Columbian University, Washington, D.C., from 1894 to 1898, and gained admission to the bar. In October, 1899, he resigned his position in the Patent Office to take another with Wetmore and Jenner, patent lawyers, 34 Pine Street, New York City, where he is now located.—After a long course of musical study abroad, Arthur Farwell returned to this country, and during the winter of 1899-1900

conducted the People's Orchestra of Brooklyn, N.Y. In May, 1900, he lectured on Beethoven before the Brooklyn Institute of Arts and Sciences. At present he is lecturer on music at Cornell University, his address being in care of the university, Ithaca, N.Y.—It will be remembered that S. C. Keith, Jr., is engaged in the culture of a very choice species of bacteria for flavoring butter, by the use of which "June butter" may be made at all times in the year. Creameries using Keith's butter cultures were awarded six gold and silver medals upon their exhibits at the Paris Exposition.—At Terre Haute, Ind., on October 24, 1900, William S. Resor was married to Miss Mayme M. Woolsey. Resor's address is corner Church and Drummond Streets, Nashville, Tenn; and he has a position with the American Telephone and Telegraph Company as inspector for Tennessee, Alabama, Mississippi, and Louisiana.

1894.

S. C. PRESCOTT, *Sec.*

Mass. Inst. Technology, Boston.

It is pleasing to all Institute men and to '94 especially that

two of its members, C. G. Abbot and F. E. Fowle, Jr., were so prominently connected with the eclipse observations conducted by the Smithsonian Institution during the past summer. The government party was located at Wadesboro, N.C., and was under the direction of Mr. Abbot, who had made extensive preparations for the event. To his careful foresight and admirable planning, not less than to his skill in execution, the great success of the expedition was due. Mr. Fowle was in charge of the photographic work of the expedition, and was very successful with his instrument, a thirty-eight focus telescope of five inches' aperture. He obtained seven good negatives during totality. The results of the observations were most satisfactory to all, and reflect great credit on the men in charge. Abbot and Fowle were in Wadesboro for a month, and report, aside from hard work, a delightful and inspiring gathering of scientists, and boundless hospitality from the townspeople. — L. P. Lane, assistant in the department of documents and statistics of the Boston Public Library, has published, in Nos.



49 and 50 of the *Quarterly Publications* of the American Statistical Association, a valuable article on "Aids in the Use of Government Publications," containing a select list of the principal guides and other sources of information relating to United States documents.—C. A. MacClure, who for several years has been with Peabody & Stearns of Boston, has severed his connection with that firm, and opened an office as architect in Pittsburg, Pa. His address is 709 Ferguson Building.—W. S. Hulse has removed from Buenos Ayres to Berlin, Germany, the home office of the Union Electricitätsgesellschaft, with which he is connected.—J. W. Phelan was married in August to Miss Florence Kimball, of Dorchester, and has established his new home in Jamaica Plain. Phelan spent several months in the spring and summer of 1900 in Porto Rico, investigating some important problems in Agricultural Chemistry. His work required him to do a great deal of travelling, and during his absence he crossed and recrossed the island several times by the excellent military road from San Juan to Ponce. Aside from this road, however, travel

was most uncomfortable. During his absence he visited nearly every important town on the island.—L. K. Davis is chemical engineer for the Cellulose Products Company, 28 Binford Street, Boston.—H. M. Chase has recently established dye-works in Wilmington, N.C. In addition to dyeing the yarns used by the Wilmington Cotton Mills, he is also engaged in the manufacture of some textile specialties.—H. R. Batcheller is investigating a placer gold-mining proposition in New Hampshire, and has nuggets of considerable size from the locality, which has never before been suspected as being gold-bearing.—George B. Haven, instructor in mechanical engineering at the Institute, is in charge of the advanced mechanical drawing at the Boston Young Men's Christian Association evening school, and in addition is giving this year a course of lectures on elementary machine design. Several other Institute men are also engaged in the work of instructing at the same place.—C. A. Howes has recently taken up the study of Chinese. He is a postage-stamp enthusiast, and has a very valuable collection. His

interest in this direction, together with the political interest now centering in China, has been the incentive to this novel but somewhat arduous source of enjoyment.—George Owen is with the Herreshoff Manufacturing Company, Bristol, R.I.—B. S. Harrison is consulting engineer with Cass Gilbert, architect, 111 Fifth Avenue, New York.—W. D. McJennett is with Swift & Co., Stock Yards, Chicago, Ill.—G. A. Taber and Miss Edna May Dearborn, of Winchester, were married on October 25. Taber has been engaged in various lines of civil engineering in New York City ever since graduation, being at present with the Rapid Transit Commission. Mr. and Mrs. Taber will reside at 342 West 122d Street, New York.—H. N. Parker, formerly assistant biologist, has been appointed biologist for the Metropolitan Water Board, 3 Mount Vernon Street, Boston, taking the place of F. S. Hollis, '90, who resigned recently to accept a position at Yale. Hollis and Parker have published together several valuable papers relating to organisms causing odors or tastes in water supplies.—K. F. Wood spent a

portion of the summer in travel in Europe, and visited Paris and the Exposition while on the continent.—I. E. Beach is general manager of the Beach Soap Company of Lawrence.—H. W. Gardner has returned to the Institute as instructor in architecture after a year of study and travel in Europe as holder of an Austin Fellowship. Gardner is also chairman of the House Committee of the Technology Club, of which committee he was formerly a member.—An extract from a letter from Mr. Prescott, the class secretary, written to one of the members of the Publication Committee, will appear in the April REVIEW.

1895.

E. H. HUXLEY, *Sec.*

29 Hampshire St., Cambridgeport,  
Mass.

Mr. A. D. Fuller writes interestingly from Paris, where he is engineer for the State Exhibit at the Fair. Mr. Fuller is intending to travel until spring when the Exposition closes, and will return home some time next May.—E. E. Denison is back in Portland again, where he has a fine position with the Interna-

tional Paper Company.—J. H. Gardiner was in Boston recently, and came around to the Technology Club. Mr. Gardiner is still with the Atwood Company in Stonington as designing engineer.—J. L. Newell was married September 28 to Miss Katherine M. Hall, of Brookline. Mr. and Mrs. Newell are to live in Brookline, on Walnut Street.—W. C. Brackett has a fine position with the Boston Elevated Railway, being in the office of the civil engineer for elevated lines.—L. W. Ballou returned recently from spending the summer abroad.—E. D. Barry occupies a responsible position as designer with the Cramp Company in Philadelphia.—A number of '95 men attended the launching of the new torpedo boats, "Blakely" and "DeLong," at the South Boston Yard of George Lawley & Sons Company on November 22.—P. H. Blodgett is doing well with the National Tube Company, and reports considerable enthusiasm among the Pittsburgh contingent of '95 men.—T. B. Booth is now an examiner in the United States Patent Office at Washington.—J. H. Bourne has returned from Greenville, S.C., and is an instructor in the Haverhill High School in manual training.—H. M. Crane is now with the Western Electric Company in New York City.—B. C. Donham has left the Spreckels Sugar Company, and started as a civil engineer in Alameda, Cal.—J. H. Gregory is with Allen Hazen, consulting engineer in New York, N.Y.—H. Kotschmar has been transferred to the revenue cutter "McLane" as chief engineer.—C. A. Meserve has returned from abroad, and is a master in the high school at Pawtucket, R.I.—J. W. Cooke is operating engineer of the Electric Storage Battery Company; and his address is Allegheny Avenue and 19th Streets, Philadelphia, Pa.—J. T. Dorrance is vice-president of the Joseph Campbell Preserve Company. His address is 32 North Front Street, Camden, N.J.—Dwight Newcomb Marble died at Pittsburg, September 8, 1900, of typhoid fever, having been ill only three weeks. Mr. Marble was a popular man while at the Institute, and his loss will be keenly felt by many of his former classmates. He was a member of Course VI.,

and was graduated in this course. His thesis was "Test of an Electric Light Station at Watertown, Mass.," with S. P. Hunt. Mr. Marble was born at Can-  
nelton, Ind., October 14, 1864. When he was four years old, his parents moved to Owensboro, Ky. He was graduated at Centre College in 1882, after which he entered the drug business. He was graduated at the Louisville School of Pharmacy in 1886, and still continued in the drug business until 1892, when he entered the Institute, graduating in the electrical course in 1895. He went to New York, where he became an inspector for the American Telephone and Telegraph Company. After two years in this position, he became district inspector at Pittsburg, Pa., for the same company. This responsible position he held until the time of his death. Mr. Marble was married May 10, 1899, to Miss Inez Church, of Manchester, Conn. His last illness was a short one; and he had such a vigorous constitution that his many friends who knew of his illness were confident of his recovery, and were almost totally unprepared for a fatal end-

ing. His illness became dangerous only two days before his death, and even an hour before he died he told his wife that he expected to live. His father, Mr. Levi M. Marble, who lives in Owensboro, arrived too late to see his son in life. Services were held at Pittsburg on September 10, Rev. Dr. W. H. McEwan, a Centre College classmate, officiating; and the interment took place at Manchester the next afternoon. All Mr. Marble's books, used throughout his various college courses, were bequeathed to the Institute, and form a valuable addition to the library.

1896.

F. E. GUPTILL, *Sec.*

1006 E. Main Street, Richmond, Va.

James A. Rockwell and Miss Mary Alice Tufts were married on Tuesday, October 30, 1900. Mr. and Mrs. Rockwell are now at home at 4 Worcester Square, Boston.—Mr. and Mrs. Arthur P. Underhill, who are now residing in Dorchester, Mass., are receiving congratulations upon the birth of a daughter.—Guy Wall, who has been in Rich-

mond, Va., until a year ago, is now in Indianapolis, Ind., engaged in the manufacture of automobiles.—John L. Putnam has recently left the American Telephone and Telegraph Company of Chicago, with which office he has been connected for several years, and is now in Providence, R.I., with some company manufacturing telephone apparatus and equipment.—Lucius Tyler, recently employed with the Boston & Albany Railroad at the Boston office, has accepted a position with Hollar Lock Inspection and Guarantee Company in Philadelphia.—Frank E. Gup-till is employed with the Virginia Electrical Railway and Development Company in Richmond, Va.—Charles G. Hyde has resigned his position with the State Board of Health, Boston, and has gone to Pennsylvania, where he will be connected with the extensive filtration work which is to be undertaken in that State.—E. C. Hultman is engineer for board of directors, West End Street Railway Company.—T. I. Jones is with the New York and New Jersey Telephone Company. His address

is 160 Market Street, Newark, N.J.—L. L. Lamborn is a technical chemist at 108 Fulton Street, New York, N.Y.—F. H. Smith is with the Diamond Rubber Company of Akron, Ohio.—Charles H. Paul, connected with the class of '96, has left the employ of the Metropolitan Water Board to accept a position with the Board of Public Works of Philadelphia. He will be on work connected with the improvement and extension of the Philadelphia water supply.

1897.

JOHN A. COLLINS, JR., *Sec.*

55 Jackson Street, Lawrence, Mass.

The fourth annual reunion and dinner of the class was held at Young's Hotel on Saturday evening, December 8. Eighteen members were present. By a happy coincidence the class of '98 held their dinner at the same place and the same time. They had as their guest Dr. H. S. Pritchett, President of the Institute. After the menus had been discussed, '97, at the cordial invitation of '98, adjourned to the latter's dining-hall, and there listened with

great pleasure to the address of Dr. Pritchett. Following this, an hour was spent in renewing old acquaintance. The meeting of '97 and '98 was a most enjoyable affair; and, as Mr. Winslow aptly put it in regard to the relations between the two classes, the hatchet has been forever buried. May these reunions become more frequent as the years roll on! — Mr. Arthur T. Hopkins and wife will spend the winter in Jamaica, where he goes to complete some scientific work in connection with the water supply, and in which he was engaged a few years ago. For the past year and a half he has been superintendent of the city institutions at Long Island. "The employees of the city at the institution on Deer Island last evening testified to their feeling toward Messrs. A. T. Hopkins and W. F. Clark, superintendent and deputy superintendent, in no uncertain manner. The two gentlemen were to leave their positions December 1. Last night the employees assembled in the reading-room of the institution; and the chaplain, Rev. Mr. Toulmin, voicing the sentiment of those present, expressed the universal re-

gret at the prospective severance of the friendly ties which exist, and presented to Superintendent Hopkins a magnificent gold watch and to Deputy Superintendent Clark a handsome mahogany Morris chair and a mahogany patent rocking-chair. Superintendent Hopkins, who is a Technology man, has been at the island about eighteen months, and leaves with the best wishes of every one who has been under his direction. Mr. Clark has been at the island before, leaving there when Dr. Cogswell left the position of superintendent, and going to Gallop's Island when Superintendent Hopkins took charge; and, when his service there was completed, December 1, he went to the State prison at Charlestown at the invitation of Warden Bridges, who recognizes his value as an institutional officer" [*Herald*, November 23, 1900]. — H. W. Marshall, formerly assistant biologist at the Rhode Island State College, is now studying for a Ph.D. at Johns Hopkins University. Mr. Marshall spent the summer in Labrador, studying the birds, during the course of which he took many photo-

graphs.—Percy G. Stiles is assistant in physiology at Johns Hopkins University.—George R. Wadleigh is assistant superintendent at the Jackson Fibre Company, Jackson, Tenn.—C. L. W. Pettie was married on October 17, 1900, to Miss Edith Pingree Sawyer.—E. P. Bliss, formerly with the New Jersey Steel and Iron Company, is now the engineer of the Boston branch of Jones & Laughlins, under management of George P. Ballard & Co.—W. K. Fairbanks is assistant superintendent at the Bigelow Carpet Company, Lowell, Mass.—The secretary is slowly obtaining the addresses of those men who were with us but a year or two, but who are members of the class. The catalogues of the Institute do not contain these names, and it is only by constant effort that their whereabouts can be learned. If any of the men can help in this work, such aid would be greatly appreciated.—J. W. Tewksbury, who left us in his Junior year, is in partnership with his father as Chas. W. Tewksbury & Son, brokers.—Joseph Porter Palmer was married on October 24 to Miss

Madeleine Louise Bacon at the Bacon homestead, Winchester, Mass.

1898.

CHARLES-E. A. WINSLOW, *Sec.*  
Hotel Oxford, Boston.

The third graduate dinner of the class was held at Young's Hotel, December 8, with thirty-eight members present, President H. S. Pritchett being the guest of the evening. At the business meeting before the dinner, after reports of the secretary and committees, it was voted to publish a Class Directory, E. F. Russ and H. L. Coburn being chosen to act with the secretary as a publication committee. W. L. Butcher, E. S. Chapin, and J. S. McIntyre were appointed to arrange for informal meetings at the Technology Club during the ensuing year, such meetings to be at least two in number. C. F. Wing, A. French, and P. B. Wesson were appointed to draw up resolutions on the death of J. S. Barber. J. T. Robinson, Jr., A. H. Tucker, R. W. Pratt, Jr., G. R. Anthony, and C.-E. A. Winslow were chosen to act as a dinner committee for 1901. Dinner was served in the historic Room 12, and after

it the speaking was begun by a statement from the secretary with regard to the Walker Memorial subscription. E. S. Chapin, J. S. Bleeker, W. E. Putnam, Jr., and E. F. Russ were introduced in the order named, and told briefly of the triumphs of '98 in their several departments of work. The class of '97, which was dining across the corridor, was invited to join '98 at this juncture, in order to welcome President Pritchett at his first appearance at a Technology class dinner. He was greeted with a rousing long Tech. yell; and his stirring words on the general future of the school, and in particular on the prospects for the Walker Memorial Gymnasium, were received with the greatest interest and enthusiasm. '97 and '98 then joined in a fraternal punch; and an informal reception by the President closed the most successful dinner on the records of '98.—F. B. Perry, who is with the Howard & Bulbough American Machine Company, of Pawtucket, R.I., has designed a cotton-mill in Georgia with water-power, one in Ontario, Canada, equipped with induction motors and elec-

tric transmission throughout, and twelve other cotton-mills in various parts of the South, all steam-driven.—E. Sturtevant received congratulations this autumn on the announcement of his engagement to Miss Theodora Van Horn.—William A. Marshall was married on June 14, while in the West, to Netty A. Howe. Mr. Marshall is now superintendent at the Glue Factory of Baeder, Adamson & Co. in Woburn.—J. H. A. Smith, formerly instructor at Dean Academy in Physical Culture, was married August 11 to Mollie S. Higgins, of Bar Harbor, Me. Miss Higgins was a pupil at Dean before her marriage. Mr. Smith is now in Newburyport, a teacher in physical culture and English branches.—J. T. Robinson, Jr., has done considerable work on construction of gasoline automobiles.—D. C. Fenner, who has been with the Bethlehem Steel Company since graduation, has been engaged in the development of a new method for treating self-hardening tool steel, called the Taylor-White process.—A. French is an engineering inspector of the Metropolitan Water Board, and is working



on the great Wachusett Reservoir at Clinton, Mass.—G. O. Haskell has been engaged on the design and erection of a soap factory, having a capacity of about 40,000 pounds of soap per day.—John S. Bleecker is a member of the Strollers' Club, New York.—Howard L. Coburn is a member of the Society of Arts. There ought to be more of him.—Joseph G. Coffin has been doing expert work on the "mercerization of cotton." He has also written an article on "Critical Angle," and delivered a lecture at Worcester on "Corpuscular Theory of Electricity."—Van Rensselaer Lansingh was married October 2 to Marian Love Minor, and is now living in Chicago, where he is with the Western Electric Company.—E. F. Kimball was married August 23 to Luella M. Siddmore. He is now teaching at Harvard.—G. T. Cottle is with the New York Insulated Wire Company at Wallingford, Conn., as their chemist.—D. W. Edgerly published a paper on the "Preparation of Pure Tellurium," with J. F. Norris and Henry Fay, in *American Chemical Journal* for February, 1900.—P. F. Johnson was married to

Hannah Foulke, of Philadelphia, June 26. He is a notary public of Milwaukee County, Wis., where he is superintendent of the Johnson Electric Service Company's factory.—H. R. Robinson, who is superintendent with Robinson & Co., manufacturers of threshing machinery of Richmond, Ind., has a son and heir, Charles K., born August 30.—E. A. Bragg, who is draughting with the Draper Company of Hopedale, was married October 25 to Ethel M. Bartlett.—E. R. Butterworth, of Cambridge, Mass., was married October 11 to Mary B. Reed.—Everett F. Currier, with the Hamilton Woollen Company, Amesbury, Mass., was married November 8 to Miss L. R. Pulsifer.

1899.

WALTER O. ADAMS, *Sec.*  
1776 Mass. Ave., North Cambridge,  
Mass.

Two monthly informal reunions of the class have been held at the Technology Club this fall, one on October 20 and one on November 17. About a dozen men showed up, and the meetings proved very pleasant. These reunions will be contin-

ued through the winter and spring, and will occur on the third Saturday of each month. During the past month the Technology Club came into final possession of the gift from the class voted for at our last undergraduate class meeting. Acting upon the suggestion of the Club House Committee, a Japanese lamp of bronze was selected; and this choice has met with general favor. The annual meeting and dinner of the class was held at the Technology Club on Saturday, December 22, at 6.30 P.M. Our subscriptions to the Walker Memorial Fund amount to about \$1,500. Early in January, important action will probably be taken in this matter by the committee in charge, and it is very desirable that all who have not yet subscribed should do so at once. The following have written to the secretary since the last issue of the REVIEW: Miles S. Sherrill, H. J. Skinner, E. H. Hinckley, L. R. Whitaker, C. B. Page, George H. Priest, A. L. Hamilton, Bernard Herman, and E. H. Hammond. News from outside is very welcome to the secretary, both officially and personally.—The marriage

of Harve Reed Stuart to Miss Ruth McNett took place on June 27 at Cortland, N.Y.—Arthur Hamilton was married at Lawrence, Mass., on October 1, to Miss Helen Parker, of Lawrence. A trip to England and France was taken, from which they have just returned. Mr. and Mrs. Hamilton will live at Marinette, Wis.—Lew. Emery is at Harvard Law School, taking a special course.—Bernard Herman is now with the Southern Railway in the Civil Engineers' Office, Washington, D.C.—George Priest left on November 17 for Guayama, Porto Rico, where he will be sugar chemist on a large plantation. He was accompanied by Mr. and Mrs. Rolfe of the Institute.—“Doc” Skinner (otherwise H. J., ex-Course V.) is now with the General Chemical Company at their Philips Works, Camden, N.J., as chemist.—Everett H. Hinckley is now with Thomas Leyland & Co., Boston, manufacturers of gums, colors, and calico printers' supplies.—Harold O. Ayer has lately gone to Savannah, Ga., to become assistant chemist in a cotton-seed oil company.—E. F. Samuels is inspector at the

Lowell Machine Shops. His address is 21 Austin Street, Hyde Park, Mass.—A. H. Cox, a former student of Course IV., has recently been admitted to the École des Beaux-Arts at Paris, receiving in the examination in architecture the highest mark awarded the foreigners.

1900.

GEORGE E. RUSSELL, *Sec.*

Mass. Inst. of Technology, Boston.

Class members looking for class information can find no better investment than a subscription to the REVIEW. The past two numbers have been rich with class news, nearly every graduate member having been located. Do not forget that the REVIEW cannot run itself, and needs the loyal support of every man in the class. Subscriptions sent to the secretary will be handed to the REVIEW.—Frederick Hosmer Cooke has left the position he held with the Brown Hoisting and Conveying Company to accept a position with the Boston Elevated Company as draughtsman. He may be found at 350 Atlantic Avenue, Boston.—Charles E. Smith has

severed his relations with Mr. Card in Putnam, Conn., and is now draughtsman in the Bridge Department, N.Y., N.H. & H. R.R. While in Putnam he was engaged in the work of road-building and macadamizing, having sole charge of the work.—Arthur B. White has been retained by the Institute as assistant in civil engineering.—George A. Tweedy writes that he finds occupation in California as State inspector of mines. Mr. Tweedy has our sincere congratulations.—F. W. Witherell has also changed his address to York, Pa., where he is engaged in operating a filter plant for the city. For some time since graduation he has been with Rice & Evans, hydraulic engineers of Boston.—Willard W. Stone, with Arville C. Redman, is engaged in municipal work in Washington, D.C.—Frederick W. Smith has returned to the Institute for further study, having just recovered from a severe case of typhoid fever.—Samuel B. Elbert writes from Honduras, where he is working a placer gold mine.—Lewis Emery, 2d, is studying at the Harvard Law School.—Ed.

North, 2d, is also at Harvard, pursuing advanced courses. During the summer just past he travelled extensively over Southern Europe, visiting the mines there for the purpose of collecting data concerning the same.—G. M. Holbrook, W. A. Dorey, and W. A. Moulton are a strong trio in the works of the Illinois Steel Company.—James H. Batcheller is mine-working in Lead City, So. Dak.—Movement is now on foot toward securing a special meeting place for class members in and about Boston. Once a month at least, following examples of other classes, members could come together at the Technology Club, have dinner together, and spend a pleasant evening talking over the happenings of past and present. The club very kindly throws open its doors for this purpose, and urges the classes to make use of the privilege. Notices will be sent to members who can attend, notifying them of each date. The class reunion and dinner will be held soon, and it is hoped that in numbers and enthusiasm we shall break all records. Meanwhile why not let the men in other cities and States form local societies

and hold monthly meetings? When you hold them, write about them to the secretary, and room will be given them in the REVIEW. Remember that the fame and future of Technology rest with her alumni; and, to make themselves firm and united in their efforts to aid her, they must be firm and united among themselves.—It becomes the sad duty of the secretary to announce the death of John Wallace Paget. Paget was with us only a year; but in that short time those who knew him found in him a comrade and classmate whose memory will always be with us. He came to the Institute with the determination to make of himself all that was possible; and the life he led with us certainly showed that he was making a good start. He was always taking an active part in class proceedings and athletics. As captain of our football team, he displayed remarkable qualities as a leader of men. Early in the second year he was obliged to give up work on account of consumptive tendencies, but hoped that a trip West would strengthen him sufficiently to resume his studies the year fol-

lowing. Disappointment was in store for him, however; after over two years of health-seeking in Denver, Col., he gave up hope, and came home to spend what remained of life to him with his folk. A few weeks ago came the sad news of his death at home on Tuesday, October 30.—Following quickly the announcement of Paget's death has come the sad news that the ranks of the graduates have been broken into, and death has taken from us Frank William Littlefield. Littlefield had been South since graduation, working with a large coal and coke company in Landgraf, W. Va. The first news of his illness came to his parents at Peabody, Mass., on December 5, stating that he had all the symptoms of motor paralysis, and needed the very best medical attendance. His mother hastened at once to him, and was with him only a few hours before he died. As far as can be learned at the time of writing, Littlefield was not subject to such attacks, but had been working very hard; and it is feared that unconsciously he went beyond his strength. It is a peculiarly sad incident. We who knew

him knew him as a most faithful student, a bright scholar, and a man whose friendship was highly valued. He was, perhaps, more quiet in manner and conversation than some of his fellows; but the determination, zeal, and enthusiasm which he displayed in bending all his energies to his life-work made him a marked man. As he was in school, so we found him in life. His work in Landgraf called upon him to work nights, yet he was active the larger part of the day. The remains were brought home to Peabody; and on Wednesday, December 12, his funeral occurred. His class and course were represented by Howard C. Plummer, Lewis Emery, 3d, and W. Leonard Stevens, who acted as bearers. Professor Robert H. Richards, of the mining department, was also present.

#### RESOLUTIONS

Whereas our heavenly Father has deemed it wise to take from us our dear friend and classmate, Frank William Littlefield, be it *Resolved*, That, mindful of our great loss, we offer our tribute of respect and esteem for the life so earnestly and conscientiously lived, and to his bereaved parents and friends express our heartfelt sympathy.

For the Class of 1900. George Edmond Russell, Secretary.

C. C. Briggs, Jr., is draughtsman for the firm of Jones & Laughlin, Ltd., American Iron and Steel Works. His address is 153 Craig Street, Philadelphia, Pa.—S. P. Brown, of 296 Rawson Street, Atlanta, Ga., is engaged in mill engineering.—D. S. Johnson is engineer of the

Philadelphia Smelting and Refining Company, Pueblo, Col.—William G. Pigeon is draughtsman with Shepley, Rutan & Coolidge, Boston, Mass.—The address of F. C. Lincoln is San Bernardo, San Miguel County, Col.